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SCRIPT OF R

SUPREME COURT OF THE UNITED STATES

No. ~~306.~~ 48.

THE CHICAGO AND NORTHWESTERN RAILWAY COMPANY, APPELLANT,

VS.

THOMAS SAYLES.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF ILLINOIS.

FILED NOVEMBER 8, 1875.

SUPREME COURT OF THE UNITED STATES.

No. 306.

THE CHICAGO AND NORTHWESTERN RAILWAY COMPANY, APPELLANT,

VS.

THOMAS SAYLES.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF ILLINOIS.

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1 Pleas in the circuit court of the United States for the northern district of Illinois, before the judges thereof sitting in chancery, at the United States court-rooms in the city of Chicago, in the district aforesaid, on Monday, the twenty-second day of December, in the year of our Lord one thousand eight hundred and seventy-three, and of our Independence the ninety-eighth year.

WILLIAM H. BRADLEY, *Clerk.*

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

NORTHERN DISTRICT OF ILLINOIS, *ss:*

Be it remembered that on the seventeenth day of March, A. D. 1873, came said complainant, by his solicitor, and filed in the office of the clerk of the circuit court of the United States for said district his bond for costs, and at the same time filed his petition to restore the record in said entitled cause, which said bond and petition are respectively in the words and figures following, to wit:

Bond for costs.

UNITED STATES OF AMERICA,
Northern District of Illinois, ss:

Circuit court, March term, A. D. 1873.

2 THOMAS SAYLES
vs.
CHICAGO AND NORTHWESTERN RAILROAD Company. } In equity.

We enter ourselves security for costs in this cause, and promise to pay all costs which may accrue to the opposite party in this action or to any of the officers of this court; and in default of payment by the plaintiff of any costs ordered or adjudged to be paid by him, hereby agree and stipulate that execution may issue against our property for any costs taxed against him.

Dated this seventeenth day of March, 1873.

ALBERT H. WALKER.
JNO. E. SAYLES.

(Endorsed:) Filed March 17th, A. D. 1873. W'm H. Bradley, clerk.

Petition to restore record.

In the circuit court of the United States in and for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In equity.

To the honorable judges of circuit court of the United States for the northern district of Illinois:

Your petitioner, Thomas Sayles, respectfully shows unto your honors

that on or about the twenty-eighth day of December, in the year
3 one thousand eight hundred and sixty-one, he filed in this court
his bill of complaint against the Chicago and Northwestern
Railroad Company; that thereupon a subpœna ad respondendum was
duly issued out of said court against said defendant and in the usual
form; that said subpœna was duly served by the proper officer upon
the said defendant; that afterwards, and on the first Monday of February,
eighteen hundred and sixty-two, the said defendant, by its solicitors,
Mess's Blodgett and Winston, entered an appearance in said
cause; that afterwards, and on the fourth day of March, eighteen hundred
and sixty-two, the said defendant filed in said court its answer to
the said bill of complaint; that afterwards the said complainant, on or
before the first Monday of April, eighteen hundred and sixty-two, filed
in said court his replication to said bill in the usual form; that afterwards
testimony was taken in said cause by both parties, and the cause
was brought to a final hearing before his honor Judge Drummond, who
on the thirteenth day of February, 1865, decided the case in favor of
the complainant, and an interlocutory decree was duly entered in said
cause referring the same to a master to take testimony and report upon
the question of damages; that the parties thereupon proceeded to take
testimony on such question of damages, and entered into a written
stipulation to be used as evidence; that subsequently, and before the
master's report was made, upon motion of the defendant, said
4 decree was opened and set aside some time in the month of May,
A. D. 1867, and defendant had leave to introduce newly-discovered
evidence as to certain car-brakes said to have been in use on a certain
car known as the "John Tyler" and upon the Camden and Amboy
Railroad prior to the alleged invention of Batchelder and Thompson;
that thereafter new proofs were taken by the defendant and rebutting
evidence was taken by the complainant; that afterwards said cause was
again brought to a hearing, and afterwards, and on or about the sixth
day of July, 1871, the court decided said cause in favor of the complainant,
and a decree was entered accordingly, and the cause was again referred
to a master to take proofs and report on the question of damages;
that while the cause was in this condition and before the report
of the master was made, and during the night of the eighth and ninth
days of October, one thousand eight hundred and seventy-one, all of the
papers and records in this cause were destroyed by fire.

Your petitioner further represents that he herewith files a pamphlet, marked "Exhibit A," which contains:

A. 1st. A true copy of the original bill of complaint in said cause.

2d. A copy of the answer filed by the defendant to said bill.

3d. A copy of the testimony taken on behalf of the defendant prior to the first hearing above mentioned.

5 B. Also another pamphlet, which is a copy of the testimony (except documentary) taken by the complainant prior to said first hearing, and is marked "Exhibit B."

C. Also another printed volume, in pamphlet form, which contains and is a copy of the complainant's new proofs, taken after the opening of said first-mentioned decree, and is marked "Exhibit C."

Also a copy of the first above-mentioned decree, which was entered on the sixth of March, 1865, and is marked "Exhibit D."

Also a copy of the second decree, which was entered July 18th, 1871, and is marked "Exhibit E."

Also two other pamphlets, or two volumes in pamphlet form, which are marked respectively "Exhibit F," "Exhibit G," which two last-mentioned exhibits—F and G—contain and are a copy of the defendant's new proofs, taken after the opening of said first-mentioned decree.

Your petitioner therefore prays that this petition and the accompanying exhibits herein mentioned may be taken as and stand for and in place of the record in said cause destroyed as aforesaid, and the original papers therein filed, except that complainant may, upon application to the court hereafter, have leave to file his said documentary evidence.

THO'S SAYLES.

WEST AND BOND,
Solicitors.

I consent that the papers referred to as exhibits in the foregoing petition may be filed and treated as the originals of those of which
6 they purport to be copies.

Chicago, March 15th, 1873.

JNO. N. JEWETT,
Sol'r for Def'ts.

(Endorsed:) Filed March 17, 1873. W'm H. Bradley, cl'k.

Exhibit A, being a true copy of the original bill of complaint and the answer thereto referred to in said petition, is in the words and figures following, to wit:

7 EXHIBIT A.

Circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company.
} In equity.

To the judges of the circuit court of the United States for the northern district of Illinois:

Thomas Sayles, of Lansinburgh, in the county of Rensselaer, in the State of New York, and a citizen of said State and of the United States, brings this his bill of complaint against the Chicago and Northwestern Railroad Company, a corporation created and existing under the laws of the State of Illinois, and owning and operating, under authority from the said legislature, and within the States of Illinois and Wisconsin and the northern district of Illinois, a railroad running from the city of Chicago, in the State of Illinois, to the town of Appleton, distant from Chicago two hundred and thirteen miles, in said State of Wisconsin. And thereupon your orator complains and
8 says, as he is informed and believes, that heretofore and before the 6th day of July, 1852, Lafayette F. Thompson, of Charlestown, Massachusetts, and Asahel G. Bacholder, of Lowell, Massachusetts, who were then, and have been ever since and are now, citizens of the United States, were the original and first inventors of a certain new and useful improvement in railroad-car brakes; that being such inventors, the said Thompson and Bacholder, prior to the granting of the letters patent hereinafter mentioned, assigned to one Henry Tanner, of Buffalo, New York, who was then, and has been ever since and is now, a citizen of the United States, all their right, title, and interest in

said improvement, by an assignment in writing, which was entered of record in the United States Patent Office, and duly made application in writing to the Commissioner of Patents of the United States for the granting of letters patent for said improvement, and duly swore to the specification for that purpose; that the said improvement was not, at the time of the said application, in public use or on sale with the consent or allowance of the said Thompson and Bachelder, as the inventors of the same, contrary to the provisions of the statutes of the United States in such case made and provided, and was not known or used by others before the invention thereof by the said Thompson and Bachelder; that the said Thompson and Bachelder and the said Tanner duly complied, in all respects, with all the necessary conditions and requisitions of the statutes of the United States in such case made and provided, prior to the granting of the letters patent hereinafter mentioned; that on the 6th day of July, 1852, letters patent of the United States, dated the day and year last aforesaid, were granted to the said Henry Tanner, according to law, whereby there were granted to him, his heirs, administrators, or assigns, for the term of fourteen years from the 6th day of July, 1852, the full and exclusive
9 right and liberty of making, constructing, using, and vending to
others to be used, the said improvement, a description whereof was given in the words of the said Thompson and Bachelder, in a schedule which was annexed to the said letters patent, and was made a part of the same; that the said letters patent were issued in the name of the United States of America, and were sealed with the seal of the Patent Office of the United States, and were signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, and were duly issued and delivered to the said Henry Tanner, and that the same, and the schedule and drawings annexed to and making part thereof, are now in the possession of your orator, ready to be produced as this honorable court shall direct; that before the said Henry Tanner obtained the said letters patent he delivered to the said Commissioner of Patents a written description of the said invention, and of the manner and process of making, constructing, and using the same, in such full, clear, and exact terms as to enable any person skilled in the art to which it appertains, or with which it is most nearly connected, to make, construct, and use the same, and that such description fully explained the principle and the several modes in which the said inventors contemplated the application of that principle or character by which the said improvement may be distinguished from other inventions, and also particularly specified and pointed out the part, improvement, and combination which the said inventors claimed as their invention; that the said description was accompanied with duplicate drawings and written references (one of which drawings was deposited in the said Patent Office and the other of which was annexed to the said letters patent), and also with a model of said invention, of a convenient size to exhibit advantageously its several parts; that the said description and
10 drawings were signed by the said Thompson and by the said
Bachelder, and were attested by two witnesses, and were filed in the said Patent Office; and that, in connection with the said application, the said Thompson and the said Bachelder also made oath before a person authorized by law to administer oaths that they were citizens of the United States, that they did verily believe that they were the original and first inventors or discoverers of the said improvement, and that they did not know or believe that the same was ever before known

or used; and paid into the Treasury of the United States the sum of thirty dollars.

And your orator further shows that a copy of the said letters patent, and of the schedule thereto annexed, is (without the drawings forming a part of the same) hereto annexed, marked "A," and he prays that the same may be taken as part of this bill.

And your orator further shows unto your honors that on the 27th day of January, 1853, the said Henry Tanner commenced an action on the case in the circuit court of the United States for the northern district of New York against the New York and Erie Railroad Company, a corporation created by an act of the legislature of the State of New York, and owning and operating, under authority from the said legislature and partly within the State of New York and the northern district of New York, a railroad running from the city of New York to Dunkirk in said State of New York, and running in part through a portion of said northern district of New York, to recover damages for the infringement and violation by them of the said letters patent; that they appeared in the said suit by attorney, and put in a plea of the general issue, and also gave the four several notices of special matter of defense, which are set forth in the record of judgment of which a copy is 11 hereto annexed, marked "B"; that the issue in said action was tried before the said circuit court of the United States for the northern district of New York, and by a jury, at a stated term of said court held at the city of Albany in said northern district of New York, on the third Tuesday of October, in the year 1854; that upon said trial said Henry Tanner proved that the improvement covered by said letters patent was useful, and that a person skilled in the art of constructing railroad-car brakes could construct the said improvement from the written description of the same, and of the manner of constructing the same, contained in the said schedule, and that its predominant utility consists in the ability of one brakeman to bring down all the brakes simultaneously upon the eight wheels of a platform-car, by operating or turning the windlass at either end of such car, and that it was further useful in being capable of accommodating very nearly equally the application of the brakes to a change from a straight line to a curved line and from a curved line to a straight line of railroad, and also proved that after the granting of said letters patent and before the commencement of said action the said The New York and Erie Railroad Company used the said brake upon the cars running upon its railroad in the northern district of New York, without the leave and license of the said Henry Tanner; that upon said trial the said New York and Erie Railroad Company gave evidence tending to prove that in the year 1843, at Springfield, in the State of Massachusetts, an eight-wheeled platform-car was constructed, having two trucks of four wheels each, with a brake to each wheel, and a windlass at each end of the car, that the windlass at either end could operate all the brakes of both trucks, not by means of a centre vibrating lever, or any equivalent therefor, but by means of two chains winding around the barrel of each 12 windlass, one chain leading to and operating the brakes of one truck and the other chain leading to and operating the brakes of the other truck, there being such an arrangement for each windlass, and each windlass having its own set of chains, connecting rods, and levers throughout, independent of those of the other windlass, the brakes of the two trucks not being combined with the windlasses at both ends of the car by any centre vibrating lever, or in any other way, or connected with such windlasses except as first described, and the

brakes being connected with one windlass by one set of chains, connecting rods and levers, and with the other windlass by an entirely different set of chains, connecting rods, and levers, and there being two chains on the barrel of each windlass, so that if one chain gave way the other chain still remained operative, and that such arrangement of brakes was used on two platform crate-cars on the Western Railroad, in Massachusetts, during parts of the years 1843 and 1844; that in reply to such evidence the said Henry Tanner proved on said trial that in such arrangement of brakes the two chains on the windlass would overlap each other in being wound upon the barrel, and that in consequence thereof, and in the passage of the truck from a straight line to a curved part of a railroad, and vice versa, the action of the brakes would be unequal in consequence of the different lengths of the two chains on each windlass, accompanied by a tendency either to break the short chain, or throw the wheels from the rails, or destroy the free swiveling action of the trucks, and that the combination in such arrangement was different from that described and claimed in said letters patent, in that the brake-levers in the two trucks were not connected together except at the windlasses, instead of being combined together by means of the centre vibrating lever; that upon said trial the said The New York and Erie Railroad Company also gave evidence tending to prove that Willard J. Nichols invented
13 the same combination of the car-brakes of an eight-wheeled car
by means of a centre lever, which is claimed in said letters patent, and insisted that the effect of such evidence was that said Nichols made such invention in the fall of 1846, at Hartford, Connecticut, and that a drawing of the same was made, and that in that fall said Nichols instructed Ferdinand Le Pennes how to construct such combination and apply it to the brakes of an eight-wheeled car, and that in the winter of 1846–1847 it was constructed under such instruction and applied to a new car upon the New Haven, Hartford and Springfield Railroad, and continued in use upon said car until the time of said trial, and that the same was thereafter put upon new cars upon that road as fast as they were manufactured; that upon said trial the said Henry Tanner claimed that the effect of the said evidence so given on the part of the said The New York and Erie Railroad Company, in regard to the said invention by the said Nichols, was that the same was not made by said Nichols until March or April, 1847; that upon said trial the said The New York and Erie Railroad Company also gave evidence tending to show, that substantially and in principle, what is claimed in said letters patent was invented by one Nehemiah Hodge in 1848, that letters patent for the same were granted to said Hodge by the United States on the 2nd of October, 1849, and that the said invention of said Hodge went into use about that time; that upon said trial the said The New York and Erie Railroad Company also gave evidence tending to prove that a certain brake for an eight-wheeled car was unsuccessfully tried upon the railroad of the New Jersey Railroad and Transportation Company, in 1842, by one Isaac Newton Stanley, and that a certain other brake for an eight-wheeled car was unsuccessfully tried upon the same railroad in 1842, by one Joseph F. Talson, and the said The New York and
14 Erie Railroad Company insisted that each of said two brakes
embodied the invention claimed in said letters patent to said Tanner; that upon said trial the said Tanner proved that the said Thompson and the said Bachelder invented, in the fall of the year of 1846, the improvement claimed in the said letters patent to said Tanner, that they made drawings embodying said improvement in October, 1846, and made a model containing the said improvement in January, 1847, which

model was produced and put in evidence on said trial, and that they made application for letters patent for said improvement in June, 1847; that upon said trial the said Tanner proved that the said The New York and Erie Railroad Company had so used the said improvement claimed in said letters patent to said Tanner, not only in the form and arrangement described in said letters patent to said Tanner, but also in the form and arrangement described in said letters patent to said Hodge, and also in the form and arrangement described in letters patent of the United States granted to Francis A. Stevens, November 25th, 1851; that upon said trial the said The New York and Erie Railroad Company set up in defense to said action not only that the said improvement covered by said letters patent to said Tanner was known and in public use prior to the time when it was invented by said Thompson and said Bachelder, but that said Thompson and said Bachelder had abandoned their invention to the public, and that the said letters patent to said Tanner were illegally and improperly and fraudulently issued, and that the brakes constructed in accordance with the description in the said letters patent to said Hodge, and the brakes constructed in accordance with the description in the said letters patent to said Stevens, were not infringements of the said letters patent to said Tanner; and that after a full and thorough trial the jury found a verdict for the said Tanner in said action for seventy-
15 five dollars damages, that having been the amount agreed upon
by the counsel for the respective parties as the amount in which the jury should find for the plaintiff, if they should be of opinion that he was entitled to recover; and the said jury also found specially that the Stevens brake and the Hodge brake, before named, were both of them infringements of the said letters patent to said Tanner; and your orator annexes hereto a copy of a certified copy of said verdict, which is marked "C," and which he prays may be taken as a part of this bill.

And your orator further shows that a judgment upon said verdict, in favor of the said Henry Tanner, against the said The New York and Erie Railroad Company, for four hundred and thirty-nine dollars and forty-four cents, damages and costs, was duly entered and docketed in the said circuit court of the United States for the northern district of New York, in the office of the clerk thereof, on the 2nd day of February, 1855, a copy of a certified copy of the record of which judgment is hereto annexed, marked "B."

And your orator further shows that the said The New York and Erie Railroad Company took a bill of exceptions on said trial, for alleged errors in the charge of the court to the jury, and upon said bill a motion on the part of the said The New York and Erie Railroad Company for a new trial in said action, came on to be heard at a special term of the circuit court of the United States for the northern district of New York, held at Buffalo on the 7th day of August, 1855, before his honor M'r Justice Nelson, one of the associate justices of the Supreme Court of the United States, and his honor Judge Hall, district judge of said district, and that thereupon the said bill of exceptions was abandoned by consent of the counsel of the said The New York and Erie Railroad Company, the said motion for a new trial was denied, and an
16 order was then and there duly entered denying the same, a copy
of a certified copy of which order is hereto annexed, marked "D."

And your orator further shows that after the entering and docketing of the judgment aforesaid, and while the said motion for a new trial was pending, your orator commenced a suit in equity, by bill filed in the circuit court of the United States for the northern district of New York,

against the said The New York and Erie Railroad Company, to restrain them from violating the rights secured to your orator by the said letters patent to the said Tanner, and by the two instruments in writing hereinafter specifically set forth and described, executed, and delivered by the said Tanner to your orator, in which said bill your orator prayed that the said The New York and Erie Railroad Company might be perpetually restrained and enjoined from violating the rights of your orator as aforesaid, either by using the said Tanner brake or the said Hodge brake, or the said Stevens brake and that they might account for and pay over to your orator all such gains and profits as had or might have accrued or arisen to or been earned or received by them from the use by them of the said invention and improvement claimed in said letters patent to said Tanner, and that a provisional or preliminary injunction might issue against them to the same purport, tenor, and effect as was prayed for in regard to said perpetual injunction; and your orator caused to be served upon the said The New York and Erie Railroad Company a subpœna to appear and answer in said suit in equity, and a copy of said bill and a notice of the making of a motion before the judges of said last named court at said special term at Buffalo, on the 7th day of August, 1855, that a preliminary injunction against the said defendants issue out of and under the seal of the said court, according to the prayer of the said bill in that behalf, in which said suit in
17 equity the said The New York and Erie Railroad Company duly appeared by solicitor. And your orator further shows, that while said motion for a new trial and said motion for a preliminary injunction were pending, the said The New York and Erie Railroad Company made overtures to the said Tanner and to your orator for a settlement of the said judgment and of the said suit in equity, which resulted in said abandonment of said bill of exceptions, and in said denial of said motion for a new trial, and in the said company's acknowledging the validity of the said letters patent to the said Tanner, and the infringement of the same as aforesaid, and in their paying to the said Tanner the amount of the said judgment, and in their paying to your orator, for the right to use the said improvement claimed in and covered by the said letters patent to said Tanner, and for past infringements not covered by said verdict, and for a discontinuance of said suit in equity, the sum of two thousand three hundred dollars, and the costs of said suit in equity, and in the signature by their attorneys of a certificate, of which a copy is hereto annexed, marked "E." And your orator, upon information and belief, avers that the amount of the said judgment was paid to the said Tanner by the said The New York and Erie Railroad Company; and your orator avers, that the said twenty-three hundred dollars, and the costs of the said suit in equity, were paid to your orator by the said company, and that a license was given by your orator to and received by them under said letters patent to said Tanner, and that said suit in equity was discontinued, and that double-acting brakes, on the plan of the invention covered by said letters patent to said Tanner, have ever since continued to be and are still used upon cars running on the railroad of the said The New York and Erie Railroad Company.

18 And your orator further shows that the said Tanner also brought an action on the case in the said circuit court of the United States for the northern district of New York, against the Hudson River Railroad Company, for an infringement of said letters patent to said Tanner by the use of the said Tanner brake, and of the said Hodge brake, and of the said Stevens brake, which action was brought about the same time with the said action at law against the The New

York and Erie Railroad Company; that the said The Hudson River Railroad Company appeared in such action and pleaded in the same, and also gave special notice of substantially the same matters of defense of which the said The New York and Erie Railroad Company so gave notice in said action at law against them; that the said action against the said The Hudson River Railroad Company was upon the calendar of the said circuit court, at the October term thereof, in 1853, and was ready for trial on the part of the plaintiff, but was put over the term, upon affidavit, on motion of the defendant's counsel, on payment of the costs of the term, and against the opposition of the plaintiff's counsel; that immediately thereafter, in October, 1853, the said The Hudson River Railroad Company made overtures to said Tanner for a settlement of said action, which resulted in their acknowledging the validity of the said letters patent to said Tanner, and the infringement of the same by the use by them of the said Tanner brake, and of the said Hodge brake, and of the said Stevens brake, and in their paying to the said Tanner, for the right to use the said brakes, and the said improvement claimed in and covered by the said letters patent to said Tanner, and for a discontinuance of said action, the sum of one thousand dollars and the costs of said action, and in the signature by their secretary and attorney of a certificate, of which a copy is hereto annexed, marked "F"; and your orator avers that the said one thousand dollars
19 and the costs of said action were paid to said Tanner by the said The Hudson River Railroad Company, and that a license was given by said Tanner to them and received by them under said letters patent to said Tanner, and that said action was discontinued, and that the said Tanner brake, and the said Hodge brake, and the said Stevens brake, have ever since continued to be and are still used upon cars running on the railroad of the said The Hudson River Railroad Company.

And your orator further shows that rights to use the said improvement claimed in and covered by the said letters patent to said Tanner have been purchased and taken from and paid for to said Tanner, by a large number of the leading railroad companies in the United States, and, among others, by the New York Central, the New York and New Haven, the New York and Harlem, the Housatonic, the Baltimore and Ohio, the Baltimore and Susquehanna, the Fitchburg, the Boston and Worcester, the Eastern, the Boston and Maine, the Boston and Providence, the Old Colony, the Rensselaer and Saratoga, the Saratoga and Washington, the Long Island, the Elmira and Canandaigua, the Canandaigua and Niagara Falls, the Buffalo and State Line, the Western Vermont, the Cheshire, the Concord, the Troy and Boston, the Canal, the South Shore. the Richmond and Petersburg, the Vermont Valley, the Portland, Saco and Portsmouth, the Providence and Worcester, the New London, Willimantic and Palmer, the Stonington and Providence, the Worcester and Nashua, the Buffalo and New York City, the Buffalo, Corning and New York, the Erie and Northeast, and by other railroad companies in the United States; and that the said Tanner brake, or the said Hodge brake, or the said Stevens brake, is and has for some time past been used upon cars running upon the railroads of all the said-named railroad companies.

20 And your orator further shows that rights to use the said improvement claimed in and covered by the said letters patent t said Tanner have been purchased and taken from and paid for to you orator, since he acquired his said interest in said letters patent, by th following railroad companies in the United States, namely: the Illinoi

Central, the Vermont and Massachusetts, the Albany Northern, the Rutland and Washington, the Rutland and Burlington, the Sullivan, the Connecticut and Passumpsic River, the Naugatuck, the Portland and Kennebec, the Atlantic and S't Lawrence, the Danbury and Norwalk, and by over twenty-five other railroad companies in the United States; and that the said Tanner brake, or the said Hodge brake, or the said Stevens brake, is and has for some time past been used upon cars running upon the railroads of all the said-named railroad companies.

And your orator avers and claims that by the said verdict and judgment, and by the settlements and licenses and acquiescences and uses hereinbefore set forth, the validity of the said letters patent to said Tanner, and the novelty and utility of the invention claimed in the same, and the fact that the use, without license under the same, of the said Hodge brake and of the said Stevens brake is in violation and infringement of the same, are fully established and settled.

And your orator further shows that on the thirteenth day of July, 1854, the said Henry Tanner, by an instrument in writing duly executed by him, under his hand and seal, and bearing date on that day, and then duly delivered to your orator, sold, assigned, transferred, and set over to your orator, in consideration of the sum of twenty-five thousand dollars, all his, the said Tanner's, right, title, interest, and claim whatsoever, which he had or might have, in and to the said letters patent to said Tanner, and the invention covered by the same, and any extension thereof that might 21 thereafter be granted by reason of said letters patent, or otherwise, excepting the following reserved territory and railroad corporations, to wit: all of the States of Ohio, Indiana, and Illinois (excepting the Illinois Central Railroad, which was thereby sold to your orator), and reserving unsold further, the Michigan Central Railroad, and the Michigan Southern and Northern Indiana Railroad, and the Ohio and Mississippi Railroad, and the Louisville and Nashville Railroad, and a horse railroad around the Ohio Falls, from Louisville to Portland, about three miles, more or less, and the Louisville and Frankfort Railroad, also the Hudson River Railroad, also the New York Central Railroad, also the Rensselaer and Saratoga Railroad, also the Saratoga and Washington Railroad, also the New York and New Haven Railroad, also the New York and Harlem Railroad, also the Housatonic Railroad, also the Baltimore and Ohio Railroad, also the Baltimore and Susquehanna Railroad, also the Elmira and Canandaigua Railroad, also the Canandaigua and Niagara Falls Railroad, also the Buffalo and State-Line Railroad, also the Fitchburg Railroad, also the Boston and Worcester Railroad, also the Western Vermont Railroad, also the Cheshire Railroad, also the Concord Railroad, also the Troy and Boston Railroad, also the Worcester and Nashua Railroad, also the Eastern Railroad, also the Boston and Maine Railroad, also the Canal Railroad, also the South Shore Railroad, also the Richmond and Petersburg Railroad, also the Vermont Valley Railroad, also the Portland, Saco and Portsmouth Railroad, also the Boston and Lowell Railroad, also the Boston and Providence Railroad, also the Old Colony Railroad, also the Providence and Worcester Railroad, also the New London, Willimantic and Palmer Railroad, also the Stonington and Providence Railroad, also the New Haven, Hartford and Springfield Railroad, also the Buffalo 22 and New York City Railroad, also the Buffalo, Corning and New York Railroad, and also the Erie and Northeast Railroad; and gave and granted to your orator and to his legal representatives, by said instrument, the full power to make, use, and vend, and to sell to others to make, use, and vend the said invention, in all cases, as fully and freely as he, the said Tanner, might or could have done, had such bargain and sale not been made, and thereby covenanted to and with your orator that he, the said Tanner, was the lawful owner and holder of the said letters patent, and that he had not sold to any person or persons whomsoever, or to any corporations, any interest in said letters patent, or any right to use or vend the improvement claimed therein, except as in said instrument theretofore mentioned.

And your orator avers that the said last-named instrument in writing was duly recorded in the United States Patent Office, on the 17th day of July, 1854, in Liber 13, page 1, of Transfers of Patent-Rights; and that the same is now in his possession, ready to be produced and proved as this court shall direct.

And your orator further shows that on the 23d day of January, 1855, the said Henry Tanner, by an instrument in writing, duly executed by him under his hand and seal, and bearing date on that day, and then duly delivered to your orator, sold, assigned, transferred, and set over to your orator, in consideration of the sum of five thousand dollars, all the right, title, interest, and claim which he, the said Tanner, had or might have, in and to any and all damages and profits and right of action for the same, either at law or in equity, growing out of the unlawful use or manufacture, or vending, by any person or persons, or company or companies, whether incorporated or otherwise, of the invention covered by the said letters patent to said Tanner so far as said damages and profits had not been settled for; and the said Tanner
23 did, in and by said last-named instrument, authorize your orator to bring and prosecute all actions and suits, whether at law or in equity, which he might deem proper, and, either in the name of said Tanner or otherwise, to recover such damages and profits, but at your orator's costs and charges, and for your orator's own benefit and profit.

And your orator avers that the said last-named instrument in writing was duly recorded in the United States Patent Office on the 24th day of January, 1855, in Liber M 3, page 511, of Transfers of Patent-Rights; and that the same is now in his possession, ready to be produced and proved as this court shall direct.

And your orator further shows unto your honors that afterwards, and on the fourth day of April, A. D. 1859, the said Henry Tanner, by a further instrument in writing, duly executed by him on that day and then duly delivered to your orator, sold, assigned, and set over unto your orator all the right, title, and interest and claim of him, said Tanner, before remaining in and for the States of Illinois and Kentucky in said letters patent and invention. and to all the damages due said Tanner; which said assignment was, on the 5th day of July, 1859, recorded in the Patent Office at Washington, in Liber G 5, page 263, of Transfers of Patents, and is now in the possession of your orator, ready to be produced and proved as the court shall direct.

And your orator avers that by virtue of the said letters patent to said Tanner, and of the said three instruments in writing, executed and delivered to your orator by said Tanner, your orator has been, ever since the 13th day of July, 1854, and is now entitled to and possessed of the exclusive right to make, construct, use, and vend to others to be used, the improvement claimed in and covered by the said letters patent to said Tanner, within and throughout the States of Illinois and
24 Wisconsin, and is also entitled to sue for and recover in this suit, and to receive to his own use, all the damages and profits for which the defendants are liable, for the unlawful use or manufacture or

vending by them of the invention covered by the said letters patent to said Tanner.

And your orator avers that the railroad of said defendants has, ever since the first day of June, 1859, run through and been operated in the States of Illinois and Wisconsin as aforesaid.

And your orator further shows that ever since the first day of June, 1859, the defendants, well knowing the premises, and the rights and privileges secured to the said Tanner by the said letters patent to the said Tanner, and to your orator by the said letters patent to the said Tanner, and by the aforesaid three instruments in writing, but contriving to injure the said Tanner and your orator, and to deprive them of the profits, benefits, and advantages which might and otherwise would have accrued to the said Tanner and to your orator respectively, upon their railroad and within the States of Illinois and Wisconsin, and without the license or permission either of the said Tanner or of your orator, and against the will of both of them, have unlawfully and wrongfully used and operated, and caused to be used and operated, and kept in use and operation, and are now using and operating, and causing to be used and operated, and keeping in use and operation, upon cars running upon their said railroad, and also upon their cars run with their license and consent, and under some mutual running arrangement, upon the Milwaukee and Mississippi or Milwaukee and Prairie du Chien Railroads, within said States of Illinois and Wisconsin, brakes constructed in accordance with the description contained in said letters patent to said Tanner, and known as Tanner brakes, or as Hodge or Stevens brakes, all of which brakes did and do embody and contain the
25 invention and improvement described and claimed in the said letters patent to said Tanner, namely, the combination of the brakes of the two trucks with the operative windlasses, or their equivalents, at both ends of the car, by means of a centre vibrating lever, or its equivalent, or mechanism essentially as specified in said letters patent, so as to enable the brakeman, by operating either of the windlasses, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car; but upon how many cars the defendants have so used and operated, or caused to be used and operated, or are now so using and operating, or so causing to be used and operated, the said brakes, your orator is ignorant and cannot set forth, but your orator avers that they have so used the same upon a large number of cars, and that they are now so using the same upon a large number of cars, and that they have derived and received, and are still deriving and receiving, from such use of said brakes, great gains and profits, but to what amount your orator is ignorant and cannot set forth, though he believes the same to be of the full sum of thirteen thousand dollars, and so charges the fact to be, and prays that the defendants may be required to make a disclosure of all such gains and profits.

And your orator avers that the defendants continue to use said brakes, and refuse, though warned and requested to desist from such use, or to pay to your orator the said gains and profits, by means whereof the defendants have greatly injured and are still greatly injuring your orator, and have deprived and still are depriving your orator of, and have prevented and still are preventing your orator from obtaining and receiving the gains and profits from the use of the said invention and improvement claimed in the said letters patent to said Tanner,
26 which your orator otherwise, and but for the said wrongful acts of the defendants, would have obtained and received.

And your orator prays that the defendants may be compelled, by a decree of this court, to account for and pay over to your orator all such gains and profits as have accrued or arisen to or been earned or received by the defendants, and all such gains and profits as they have been or may be entitled to by reason of such use by them of said invention and improvement claimed in said letters patent to said Tanner, and all such gains and profits as the said Tanner and your orator would respectively have received but for the said unlawful acts and doings of the defendants,and that the defendants and their attorneys, solicitors, servants, agents, and workmen may be perpetually enjoined and restrained by the decree and injunction of this court *form* directly or indirectly constructing or causing to be constructed, using or causing to be used, or vending to others to be used in any manner, any brake for a railroad-car embodying or containing the invention and improvement described and claimed in the said letters patent to said Tanner, or any brake constructed in accordance with the description contained in said letters patent to said Tanner, and known as the Tanner brake, or as Hodge or Stevens brakes, and particularly from any further using, or causing or permitting to be used, and from vending to others to be used in any manner and from putting out of their possession or otherwise disposing of any brakes in their possession or under their control, known as Tanner brakes, or as Hodge or Stevens brakes, and from in any wise counterfeiting or imitating the said invention and improvement claimed in said letters patent to said Tanner, or any brakes made in accordance therewith, and from infringing upon or violating in any way whatsoever the said letters patent to said Tanner; and that all such infring-
27 ing brakes in the possession or under the control of the defendants may be forthwith destroyed or delivered up to your orator; and that the defendants may be decreed to pay the costs of this suit; and that your orator may have such further relief, or that your orator may have such other relief, as the equity of the case may require and as to your honors may seem meet.

To the end, therefore, that the defendants may, if they can, show why your orator should not have the relief hereby prayed, and may, under their corporate seal, full, true, direct, and perfect answer make to the several matters hereinbefore stated and charged, and especially that they may set forth whether, since the first day of June, 1860, they have not used or caused to be used upon cars running upon their railroad and within the States of Illinois and Wisconsin, one or more, and how many, brakes hereinbefore mentioned, known as Tanner brakes, or as Hodge or Stevens brakes, or brakes constructed on the principle of the said Tanner specifications, and when and for how long a time the same, or any of them, were so used.

May it please your honors to grant to your orator a writ of subpœna ad respondendum, issuing out of and under the seal of this honorable court, directed to the defendants, the Chicago and Northwestern Railroad Company, commanding them to appear and make answer to this bill of complaint, and to perform and abide by such order and decree herein as to this court may seem required by the principles of equity and good conscience.

May it also please your honors to grant to your orator a provisional or preliminary injunction issuing out of and under the seal of this honorable court, enjoining and restraining the defendants, their attorneys, 28 solicitors, servants, agents, and workmen, to the same purport, tenor, and effect hereinbefore prayed for in regard to said perpetual injunction. And your orator will ever pray, etc.

GOODWIN, LARNED & GOODWIN,
Solicitors for Plaintiff, Tho's Sayles, and of Counsel.

UNITED STATES OF AMERICA,
Northern District of Illinois:

On the 28th day of December, 1861, before me came Thomas Sayles, the plaintiff in the foregoing bill of complaint, and who has signed the same; and he being by me duly sworn did depose and say that he had heard the said bill read and knew the contents thereof, and that the same was true of his own knowledge, except as to the matters which are therein stated on information and belief, and that as to those matters he believes it to be true.

And he did further depose and say that he did verily believe that Lafayette F. Thompson and Asahel G. Bachelder, in said bill named, were the original and first inventors of the invention and improvement described and claimed in the letters patent to Henry Tanner mentioned in said bill.

FRED. W. COLE,
U. S. Com'r Nor. Dist. Ill.

29 No. 9100.

The United States of America to all to whom these letters patent shall come:

Whereas Lafayette F. Thompson, of Charlestown, Mass., and Asahel G. Bachelder, of Lowell, Mass., have alleged that they have invented a new and useful improvement in railroad-car brakes (they having assigned their title and interest in said improvement to Henry Tanner, of Buffalo, N. Y.), which they state has not been known or used before their application; have made oath that they are citizens of the United States, that they do verily believe that they are the original and first inventors or discoverers of the said improvement, and that the same hath not, to the best of their knowledge and belief, been previously known or used; have paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Henry Tanner, his heirs, administrators, or assigns, for the term of fourteen years from the sixth day of July, one thousand eight hundred and fifty-two, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Thompson and Bachelder in the schedule hereunto annexed, and is made a part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

30 Given under my hand at the city of Washington, this sixth day of July, in the year of our Lord one thousand eight hundred and fifty-two, and of the Independence of the United States of America the seventy-seventh.

ALEX. H. H. STUART,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.
[L. S.] THO'S. EWBANK,
Commissioner of Patents.

The schedule referred to in these letters patent and making part of the same:

To all persons to whom these presents shall come:

Be it known that we, Lafayette F. Thompson, now or late of Charlestown, and Asahel G. Bachelder, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful mode of operating the brakes of railway-cars; and we do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1 denotes a top view of the platform-frame of a long car, resting on two truck-frames, the same also exhibiting our invention as applied to the brakes of the wheels of its two truck-frames. Figure 2 is a side elevation, and Figure 3 a vertical, central, and longitudinal section of the same. In the said drawings A denotes the platform of an eight-wheeled car resting on two truck-frames, B C.
31 D D^1, E E^1, are the wheels of one truck-frame, while F F^1,
G G^1, are those of the other truck-frame. H I K L, are the axles, while M N O P are the four sets of brakes applied to the wheels. Each set of brakes is connected to a vibrating-lever, Q R S, or T, which enables the set of brakes to swing either towards or away from their respective sets of wheels. In the above-mentioned drawings, the fulcra of these levers are at their upper ends, as seen at *a a*, etc. Under the middle of the car-platform I arrange a lever, A^1, that turns horizontally on a centre-pin, B^1.

A rod, C^2 or D^2, or its equivalent, is jointed to each end of the lever, A^1, and is extended from thence towards the end of the car, one rod being extended towards one end, while the other is carried towards the opposite end. Each rod is attached to a cord or chain, b^1, at its end, that is wound on the barrel of a windlass, E^2 or F^2, fixed on the adjacent end of the platform, there being one windlass at each end of the platform.

Between the fulcrum of the lever, A^1, and each rod, C^2, D^2, there is another rod or chain as seen at G^2, H^2, which is jointed at one end to the lever A^1, and has its other end jointed to the upper arm of one of two secondary levers, I^1, K^1,. The lower end of the lever, I^1, is jointed to the set of brakes, N, while the lower end of the lever K^1, is similarly jointed to the set of brakes O. Rods M^1 N^1, are respectively jointed to the secondary levers between their lower and upper ends, and extend therefrom and are jointed at their opposite ends to the set of brakes M, P. Under such circumstances, if a person rotates either windlass E^1 or F^1, so as to wind up its chain, he will produce a draft on the lever A^1, that will cause all the brakes to simultaneously close down upon their respective sets of wheels.

From the above it will be seen that a brakeman at either end
32 of the car, by simply turning the windlass at such end, can
simultaneously operate, or make bear against their wheels, all the sets of brakes. Our improvement can readily be applied to sets of brakes arranged between the wheels, as well as to those where the brakes clasp each wheel on its two opposite ends.

The principle of arresting or retarding the progress of two or more

cars, while in motion on a railway, by the momentum of one or more of them being made to act on the friction-brakes of said cars, through the intervention of any suitable mechanism combined with the bumpers and the brakes, or the combination of the brakes and bumpers, and a mechanism that will enable the momentum of one or more of the cars, acting against the bumpers, to force the brakes against the wheels, is not herein claimed; nor is it herein claimed to apply such momentum for such purpose, by a mode wherein the brake apparatus is so combined with the axle of one of the wheels by means of a fast pulley on such axle, an endless belt passing around such pulley, and a loose pulley on another axle or shaft, a clutch applied to such loose pulley and the second axle or shaft, whereby it may be made to rotate by the rotation of the axle of the wheels, and finally a mechanism or apparatus connecting the second shaft with the brakes of one or both trucks of a car, and made to so operate when the loose pulley is clutched to its shaft as to cause the brakes to be forced or drawn against the wheels, for such mode (it being that invented by George S. Griggs, and patented December 31st, 1839) of causing the momentum to operate to arrest the velocity of a car or train of cars, differs essentially from the invention hereinbefore set forth, and represented in the accompanying drawings; for the friction of the wheels on the rails, and the momentum of the moving carriage, is employed to put in motion machinery that is brought into action on the brakes, or caused to act on
33 them when connected with the rotating pulley, put in motion by
the pulley of the axle of the wheels, the attendant or brakeman only performing the office of moving the sliding part of the clutch. But what was claimed by us, is to so combine the brakes of the two trucks with the operative windlasses, or their equivalents, at both ends of the cars, by means of the vibrating lever A^1, or its equivalent, or mechanism essentially as specified, as to enable the brakeman, by operating either of the windlasses, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car.

In testimony whereof we have hereto set our signatures this eighth day of April, A. D. 1852.

A. G. BACHELDER.
LAFAYETTE F. THOMPSON.

Witnesses:

Daniel S. Richardson.
Nahum Leonard, J'r. (To A. G. Bachelder.)

P. C. Truman.
Milow C. McClure. (To Lafayette F. Thompson.)

34 In the circuit court of the United States for the northern district of New York.

Pleas before the judges of the circuit court of the United States for the northern district of New York, at the city of Albany, at the adjourned term of said court, held at said city, on the fourth Tuesday of January, 1853.

Witness the honorable Samuel Nelson, one of the judges of said court.

AUGUSTUS A. BOYCE, *Clerk.*

NORTHERN DISTRICT OF NEW YORK, *ss:*

Be it remembered, that heretofore, to wit, at an adjourned term of the circuit court of the United States for the northern district of New York, held at Albany, in the said district, before the judges of the said court, on the fourth Tuesday of January, 1853, the New York and Erie Railroad Company, a corporation created by the legislature of the State of New York, were summoned to answer unto Henry Tanner, of a plea of trespass on the case, for the infringement of letters patent issued to said Tanner by the United States, and bearing date July 6, 1852, for a new and useful improvement in railroad-car brakes, to his damage of ten thousand dollars, by summons personally served upon Benjamin Loder, president of said corporation, at Dunkirk, in said northern district of New York; and thereupon the said Henry Tanner, plaintiff, declared against the said The New York and Erie Railroad Company, defendants, as follows, to wit:

NORTHERN DISTRICT OF NEW YORK, *ss:*

The New York and Erie Railroad Company, defendant, was
35 summoned to answer Henry Tanner, of the city of Buffalo, in
the county of Erie and State of New York, in the northern district of said State, of a plea of trespass on the case, etc.; and thereupon the said Henry Tanner, plaintiff, by W'm F. Miller, his attorney, complains, for that whereas Lafayette F. Thompson, of Charlestown, in the State of Massachusetts, and Asahel G. Bachelder, of Lowell, in the said State of Massachusetts, were the original and first inventors of a certain new and useful improvement in railroad-car brakes, in the letters patent hereinafter mentioned and fully described, which was not known or used before the said invention, and which was not, at the time of the application for a patent, as hereinafter mentioned, in public use or on sale, with the consent or allowance of said plaintiff, or the said Thompson or Bachelder, or either of them; and the said Thompson and Bachelder, being, as aforesaid, the inventors thereof, and being also citizens of the United States, did, in due form of law, and before granting the letters patent hereinafter mentioned, assign to the said plaintiff, who is also a citizen of the United States, all their right, title, and interest to the said improvement, and thereupon, to wit, on the sixth day of July, A. D. 1852, at the city of Washington, upon due application therefor, letters patent therefor, in due form of law, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior, and countersigned by the Commissioner of Patents of the United States, bearing date the day and year last aforesaid, were issued to the said plaintiff, and which said letters patent the said plaintiff now brings here into court, the date whereof is the day and year aforesaid, whereby there was granted and secured to the said plaintiff, according to law, for the term of fourteen years after the date of the
date of the said letters-patent, the full and exclusive right and
36 liberty of making, constructing, using, and vending to others to
be used, the said invention, as by the said letters-patent will fully appear.

And the said plaintiff further says, that from the time of the granting to him of said letters patent, hitherto, he has made and vended to others to be used, the said improvement, to his great advantage and profit, and that said exclusive right was of great value to him, to wit, of the value of one hundred thousand dollars; yet the said defendant, well knowing the premises, but contriving to injure the said plaintiff in his aforesaid rights and profits, after the making of the said letters patent, and within the said term of fourteen years in the aforesaid letters patent mentioned, to wit, on the first day of August, A. D. 1852, in the northern district of New York, and at divers other times, before and afterwards, within the aforesaid term of years mentioned in said letters patent, and before the commencement of this suit, unlawfully and wrongfully, and without the consent or allowance, and against the will of the said plaintiff, did make and use the said improvement, in violation and infringement of the exclusive rights so secured and granted to the said plaintiff by said letters patent as aforesaid, and contrary to the statutes of the United States in such case made and provided, whereby the said plaintiff has been greatly injured, and deprived of great profits and advantages, which he might and otherwise would have derived from said invention, and has sustained damage to the amount of ten thousand dollars.

And whereas also, the said plaintiff, having obtained letters patent as aforesaid, and having made and vended to others to be used the said improvement as aforesaid, the said defendant, knowing the premises, but contriving and intending as aforesaid, after the making of the said letters patent and within the said term of years in the said letters patent mentioned, to wit, on the first day of August, A. D. 1852,
37 aforesaid, and on divers other days and times between that day
and the day of the commencement of this suit, to wit, in the northern district of New York aforesaid, unlawfully and unjustly, and without the leave, license, or allowance, and against the will of the said plaintiff, made and used divers, to wit, five hundred car-brakes, on the said improved plan, and in imitation of the said invention, so as aforesaid granted and secured to the said plaintiff by the said letters patent, in breach of the said letters patent, and against the privilege so granted to the said plaintiff as aforesaid, and contrary to the statutes of the United States, whereby the said plaintiff has been greatly injured, and has been deprived of great gains and profits he might and otherwise would have derived from the said invention.

Wherefore the said plaintiff says that he has sustained damage to the amount of ten thousand dollars, and by force of the statutes aforesaid, an action hath accru*de* to him to recover said damages, and such additional amount, not exceeding in the whole three times the amount of such actual damages as the court may see fit to order and adjudge.

Yet the said defendant, although often requested, has not paid the same, or any part thereof, to the said plaintiff, but refuses so to do, and the said plaintiff brings suit, etc.

And it is suggested to the court now here, that the said plaintiff gave oyer in the words and figures following, to wit, of the letters patent mentioned in the said declaration, and of the schedule referred to in the said letters patent, and annexed thereto.

(Patent omitted; see patent on page 23.)

38 *Plea.*

And the said defendant, the said The New York and Erie Railroad Company, by Charles Daniels, its attorney, comes and defends the wrong and injury, when, etc., and says that it is not guilty of the said supposed grievances above laid to its charge, or any, or either, or any part thereof, in manner and form as the said plaintiff hath above thereof complained against it, and of this the said defendant puts itself upon the country, and the said plaintiff doth the like, etc.

And it is suggested to the court now here, that the defendants gave the following notice, in writing of special matter, to the plaintiff, thirty days before trial, under section 15 of the act of Congress, passed July 4th, 1836, entitled "An act to promote the Progress of the Useful Arts, and to repeal all acts and parts of acts heretofore made for that purpose."

First notice of special matter.

Take notice that the above-named defendant will prove upon the trial of this cause, in bar of the said plaintiff's action, that the said Lafayette F. Thompson and Asahel G. Bachelder, the said assignors of said plaintiff, were not the original or first inventors of so combining the brakes of the two trucks (of a car) with the operative windlasses (thereof) or their equivalents, at both ends of the car, by means of the vibrating lever designated "A¹" in the specifications and drawings attached to the said letters patent, or its equivalent, or mechanism essentially, as specified (in said specifications), as to enable the brakemen, by operat-
ing either of the windlasses, to simultaneously apply the brakes of
39 both trucks, or bring or force them against their respective
wheels, and whether he be at the forward or rear end of the car.

And the said defendant will further prove, upon such trial as aforesaid, that the same principle was known to, and had been previously combined by, and was invented by, Nehemiah Hodge, who resides at North Adams, in the State of Massachusetts, and that the same was known to and combined by the said Nehemiah Hodge as early as November, 1848, and patented to him by letters patent dated October 2d, 1849.

And the said defendant will further prove, upon such trial as aforesaid, that what is claimed in said declaration and in said letters patent therein mentioned, and the specifications and drawings thereto attached as the invention of said assignors of said plaintiff, named in said declaration, was substantially and in principle, known to Henry Gray, E. Harris, and Calvin Stebbins, and Thomas Faas, and M'r Eddy, who each reside at Springfield, in the State of Massachusetts, and Thomas Allen, a resident of Greenbush, New York, and was publicly used by the Western Railroad Company, on its railroad in the State of Massachusetts, long prior to the time when it is alleged the said assignors of said plaintiff invented the same.

And the said defendant will further prove as aforesaid, upon said trial, that substantially what is claimed as the invention of said assignors of said plaintiff as aforesaid, was publicly used upon the cars of the Connecticut River Railroad Company, upon its railroad in said State of Massachusetts, long prior to the time when it is claimed in this action the said assignors of said plaintiff acquired a knowledge thereof, and long prior to the patenting thereof to said plaintiff, and the same was known, and said use was known as aforesaid, at all times referred to,
to Miles G. Morse, Josiah Hunt, and M'r Briggs, the master of
40 transportation upon said road, each of whom resides at Northamp-
ton, in the State of Massachusetts.

And the said defendant will further prove as aforesaid, upon said trial, that substantially and in principle, what said assignors of said plaintiff, and what said plaintiff claims in this action to be the invention of said assignors, was, long prior to the time when it is claimed the said assignors invented the same, used publicly upon the cars of the Springfield, Hartford, and New Haven Railroad Company, upon its railroad in the States of Massachusetts and Connecticut. And the said defendant will prove that the same was known to, and that said use thereof was known to M'r Le Pennes, now master mechanic in the shop of said company, at Hartford, and who resides at Hartford, in the State of Connecticut, and Nehemiah Hodge, who resides at North Adams, in the State of Massachusetts.

And the said defendant will further prove as aforesaid, upon said trial, that substantially, and in principle, what is claimed in this action to be the invention and discovery of said Bachelder and Thompson, was, on and prior to the fourteenth day of November, 1848, known to Charles B. Turner, who resides at Brooklyn, in the State of New York, and was patented to him by letters patent dated on the day last aforesaid.

And the said defendant will further prove, upon said trial as aforesaid, that the thing patented in and by the letters patent mentioned in said declaration, was not first invented by or known to said Lafayette F. Thompson and Asahel G. Bachelder, or either of them, but the same was publicly known and used prior to the time when it is alleged in this action the same was invented by them, or either of them. And the said defendant will prove that Charles B. Turner, who resides at Brooklyn, in the State of New York; Francis A. Stevens, who resides
41 at Burlington, in the State of Vermont; M'r Burton, who is agent of the Pittsfield and North Adams Railroad Company, and resides at North Adams, in the State of Massachusetts; Charles Minot, who resides at New York City; Nehemiah Hodge, who resides at North Adams, in the State of Massachusetts; Henry Gray, E. Harris, Calvin Stebbins, Thomas Faas, and M'r Eddy, each of whom resides at Springfield, Massachusetts; Thomas Allen, a resident of Greenbush, New York; M'r Briggs, Miles G. Morse, Israel R. Dickinson, Jared C. Strong, and Josiah Hunt, each of whom resides at Northampton, in the State of Massachusetts; M'r Le Pennes, who resides at Hartford, in the State of Connecticut, and John Farnsworth, who resides at Rochester, New York, possessed such prior knowledge of the said thing, mentioned as aforesaid, in said declaration.

And that the said thing was in public use and on sale anterior to the said supposed discovery or invention thereof by the said Thompson and Bachelder, and the same was in such public use upon the Western Railroad, on the cars of the Western Railroad Company, in the State of Massachusetts; and upon the Connecticut River Railroad, on the cars of the Connecticut River Railroad Company, in the State of Massachusetts; and upon the Springfield, Hartford and New Haven Railroad, on the cars of the Springfield, Hartford and New Haven Railroad Company, in the States of Massachusetts and Connecticut; and the said defendant will prove such public uses of said thing as aforesaid by the persons herein lastly above named.

And the said defendant will further prove, upon said trial as aforesaid, that the said Lafayette F. Thompson and Asahel G. Bachelder were not the original or first inventors of a substantial or material part of the thing alleged in said declaration, and claimed as new; but,
42 on the contrary thereof, the combination of the brakes of the two trucks with the operative windlasses, or their equivalents, at both ends of the car, so as to enable the brakeman, by operating either of the windlasses, or their equivalents, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car, by means of machinery equivalent to the vibrating lever, was publicly used prior to the time of the said alleged invention thereof by them, upon the cars

of the said railroad companies above named, and upon the railroads above mentioned, and the same was known, prior to the time of the said alleged invention thereof, to each of the persons whose names and residences are hereinbefore set forth.

And the said defendant will further prove as aforesaid, upon said trial, that the combination of the brakes of the two trucks with the operative windlasses, or their equivalent, at both ends of the car, so as to enable the brakeman, by operating either of said windlasses, or their equivalents, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car, was known and in public use before the alleged invention of the said Thompson and Bachelder; and the same and the previous invention, knowledge, and use thereof was known to Charles B. Turner, Francis A. Stevens, M'r Burton, Charles Minot, Nehemiah Hodge, Henry Gray, E. Harris, M'r Eddy, M'r Briggs, Miles G. Morse, Joseph Hunt, Israel R. Dickinson, Jared C. Strong, M'r Le Pennes, Calvin Stebbins, Thomas Faas, Thomas Allen, and John Farnsworth, whose respective places of residence are hereinbefore set forth; and the same was in prior public use, as aforesaid, upon the cars of the Western Railroad Company, upon its railroad, in the State of Massachusetts; upon the cars of the Connecticut River Railroad Company; upon its railroad in the State of Massachusetts; and upon 43 the cars of the Springfield, Hartford and New Haven Railroad Company, upon its railroad, in the States of Massachusetts and Connecticut; and such prior public use thereof was known to the persons last above named.

Second notice of such special matter.

Take notice, that John Farnsworth, named in the notice served upon you in this cause, with the plea of the general issue, resides at or near Dayton, in the State of Ohio, and not at Rochester, as stated in said notice.

Third notice of special matter.

Please take notice, that on the trial of this cause, in *in* addition to the notices already served upon you, the defendant will prove by Joseph F. Falson, residing in New York City; Isaac Newton Stanley, now or late of New York City; Nicholas Neafie, residing in New York City; Burnett Hughes, residing in Jersey City; Edward Beattie, residing in Jersey City; Timothy L. Smith, residing in Dunkirk; Frederick Boyce, residing in Jersey City; Moses Parsells, residing in Jersey City; M'r Anderson, sup't car-shop, residing in Providence, R. I.; Osgood Bradley, residing in Worcester, Mass.; Orsamus Eaton, residing in Troy, N. Y.; Uri Gilbert, residing in Troy, N. Y.; Ed. O. Eaton, residing in Troy, N. Y.; John Howell, residing in Norwich, Conn.; George S. Griggs, residing in Roxbury, near Boston; Francis A. Stevens, residing in Brooklyn, N. Y.; Charles Minot, residing in New York City; Nehemiah Hodge, residing in North Adams, Mass.; M'r Burton, residing in North Adams, Mass., and others, that they knew of the use of the brakes the same, or substantially the same, as the said alleged invention of the plaintiff, and that the same, or substantially the same, was used on the rail- 44 road of the New Jersey Railroad and Transportation Company prior to the alleged invention thereof by the plaintiff, or the said Thompson and Bachelder; also, the same was used on the line, or a portion of the line, of railroad between Albany and Buffalo, Troy and Schenectady, and on roads generally in the States of New York and Massachusetts, and on the roads mentioned and stated in the notice heretofore served on plaintiff's attorney, and so known as aforesaid to the persons named and others more particularly at present unknown to this defendant, prior to the alleged invention by said Thompson and Bachelder, or the said patentee; also, that the brakes claimed by said plaintiff as his patented invention were in use on the road of the defendant, and known to the persons aforesaid, and to its officers and agents generally, prior to the alleged invention by said Thompson and Bachelder, or said patentee, and that the right to use the same was purchased by this defendant of Francis A. Stevens and Nehemiah Hodge, under and by virtue of their letters patent, dated and issued prior to the patent and alleged invention on which this suit is brought, and so known as aforesaid by said plaintiff and his assignors.

That the same, or substantially the same, was previously invented, and patented August 12th, 1846, by Edward Thayer.

And that the same, or substantially the same, was previously invented, and patented July 12th, 1843, by Henry C. Sydes.

That the same, or substantially the same, was previously invented and patented by Charles B. Turner, of Buffalo, November 14th, 1848.

That the same, or substantially the same, was previously invented by Ross Winans, of Baltimore, and used on the Baltimore and Ohio Railroad, and known to the officers and agents thereof.

45 Also the same, or substantially the same, brake or alleged invention, as claimed by the plaintiff, was previously known to Miles G. Morse and Miles G. Marses, residing at Falls Village, Conn., Josiah Hunt, M'r Briggs, and M'r Dickinson, of Northampton, Mass., and used on the Connecticut River Railroad; also to Henry Gray, M'r Harris, and M'r Eddy, of Springfield, Mass., and used on the Western Railroad, and to M'r Hodge, of North Adams, Mass., and used both on said Connecticut River and Western Railroads; also to M'r Le Pennes, of Hartford, Conn., and used on the Springfield, Hartford and New Haven Railroad.

Fourth notice of special matter.

Take notice, that the defendant in this cause will prove upon the trial of this cause, under the plea of the general issue pleaded therein, that what is claimed in this action as the invention or discovery of said Lafayette F. Thompson and Asahel G. Bachelder, previous to the time when it is claimed they made such invention or discovery, was known to other persons, and that they, nor either of them, were the original or first inventors or discoverers thereof.

And the same was, previously to the time when it is claimed they invented or discovered the same, in public use, with their consent and allowance, and upon sale with their consent and allowance, and subsequent to the time when it is claimed they invented or discovered the same, and before application was made for said letters patent, the same was in public use or on sale with the consent and allowance of the said Lafayette F. Thompson and Asahel G. Bachelder, and the consent and allowance of said plaintiff; and such public use existed more than two years before the application for the letters patent mentioned and referred to in the declaration in this cause.

46 And the same was publicly used as aforesaid upon the following railroads, to wit: upon the cars used on the Western Rail-

road, in the State of Massachusetts; upon the cars used on the Connecticut River Railroad, in the State of Massachusetts; upon the cars of the Springfield, Hartford and New Haven Railroad, in the States of Massachusetts and Connecticut; upon the cars of the Pittsfield and North Adams Railroad, in the State of Massachusetts; and upon the cars of the New Jersey Railroad and Transportation Company, in the State of New Jersey; and upon the cars of the Albany and Buffalo Railroad, in the State of New York; and upon the cars of the Troy and Schenectady Railroad, in the State of New York.

And the following-named persons are the persons the defendant expects to prove, upon said trial, possessed said prior knowledge of what is claimed in this action as the invention of said Lafayette F. Thompson and Asahel G. Bachelder, to wit: Jos. F. Talson, residing in New York; Isaac Newton Stanley, residing in the same place; Nicholas Shaffer, residing in the same place; Barnard Hughes, residing in Jersey City, New Jersey; Edward Beattie, residing in Jersey City, New Jersey; Timothy L. Smith, formerly residing at Dunkirk, in the State of New York, but now residing at Jersey City, in the State of New Jersey; Frederick Boyce, residing at Jersey City, in the State of New Jersey; Moses Parsells, residing at Jersey City, in the State of New Jersey; M'r Anderson, residing at Providence, in the State of Rhode Island; Osgood Bradley, residing at Worcester, in the State of Massachusetts; Orsamus Eaton, Uri Gilbert, and Ed. O. Eaton, each residing at Troy, in the State of New York; John Shewell, residing at Norwich, Connecticut; George S. Griggs, residing at Roxbury, near Boston, in the State of Massachusetts; Francis A. Stevens, residing at Brooklyn, in the State of
47 New York; Charles Minot, residing at the city of New York;
Nehemiah Hodge and M'r Burton, residing at North Adams, in the State of Massachusetts; Henry Gray, E. Harris, Calvin Stebbins, Thomas Fass, and M'r Eddy, Hilson Eddy, Henry H. Snow, residing each at Springfield, in the State of Massachusetts; Thomas Allen, residing at Greenbush, in the State of New York; Miles G. Morse, Josiah Hunt, and M'r Briggs, residing each at Northampton, in the State of Massachusetts; M'r Le Pennes, residing at Hartford, in the State of Connecticut; Charles B. Turner, residing at Brooklyn, in the State of New York; Francis A. Stevens, residing at Burlington, in the State of Vermont; Israel R. Dickinson, Jared C. Strong, and Josiah Hunt, residing each at Northampton, in the State of Massachusetts; and Samuel Dennis of New Haven, Connecticut; John Farnsworth, who formerly resided at Rochester, in the State of New York, but more recently at or near Dayton, in the State of Ohio.

And the defendant will further prove, as aforesaid, that a substantial and material part of what is claimed in this action as the invention of said Lafayette F. Thompson and Asahel G. Bachelder, was known to said persons prior to the time when it was claimed the same was invented and discovered by them, and they were not the first or original inventors thereof, to wit, the combination of the brakes of the two trucks, with the operative windlasses, or their equivalents, at both ends of the car, so as to enable the brakeman by operating either of the windlasses, or their equivalents, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car; and also, that part of such combination as combines the brakes of each truck of a car by
rods, or their equivalents, to the operative windlasses at each
48 end of the car, so as to enable the brakeman to bring all the
brakes upon the wheels from either windlass.

And hereupon the process thereof is continued between the parties aforesaid, of the plea aforesaid, in this same court, before the judges thereof, and the issue above joined is ordered by the said court to be tried at the term of this court appointed to be held at the city of Albany on the third Tuesday of October, in the year 1854, at which day and place last aforesaid came the parties aforesaid, by their attorneys aforesaid, before the judges of the said court; and the jurors of the jury summoned to try said issue, being called, also came; who, to speak the truth of the matters aforesaid, being chosen, tried, and sworn, say, upon their oaths, that the said defendants are guilty of the premises above laid to their charge, in manner and form as the said plaintiff hath above complained against them; and they assess the damages of the said plaintiff by reason of the premises, over and above his costs and charges, by him about his suit in this behalf expended, to seventy-five dollars, and for those costs and charges, to six cents.

Therefore, it is considered that the said plaintiff do recover against the said defendants his said damages, costs, and charges, by the jurors aforesaid, in form aforesaid assessed, and also three hundred and sixty-four dollars and thirty-eight cents for his costs and charges by the court now here adjudged of increase to the said plaintiff, with his assent, which said damages, costs, and charges, in the whole, amount to four hundred and thirty-nine dollars and forty-four cents.

And the said defendants in mercy, etc.

Judgment signed this second day of February, 1855.

AUG'S A. BOYCE, *Clerk.*

49 (Endorsed:) Circuit court for the United States for the northern district of New York. Henry Tanner vs. The New York and Erie Railroad Company. Judgment record for $439.44. Samuel Blatchford, attorney for plaintiff. Filed February 2, 1855, 10 a. m.

Circuit court of the United States of America in and for the northern district of New York.

I, Augustus A. Boyce, clerk of the circuit court of the United States in and for the northern district of New York, do hereby certify that the foregoing is a true and correct transcript from an original judgment record filed and remaining of record on the file of my office, and of the whole of such original.

In testimony whereof I hereunto subscribe my name and affix the seal of the said circuit court at my said office in the city of Utica, within said district, the fourteenth day of June, A. D. 1855.

[L. S.] A. A. BOYCE, *Clerk.*

50 At a stated term of the circuit court of the United States of America for the northern district of New York, in the second circuit, held at the city hall in Albany, in said district, on Thursday, the 26th day of October, in the year of our Lord one thousand eight hundred and fifty-four.

Present, the honorable Nathan K. Hall, judge.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY.

Patent trial for infringement of brakes used on railroad-cars, and question whether the Hodge brake and Stevens brake, so called, were infringements of the plaintiff's patent. Amount of damages stipulated at $75.

"The jury came into court, and being called, answer and say, that they find for the plaintiff a verdict for seventy-five dollars damages; and that the Stevens brake and Hodge brake, used by the defendants, are infringements of the plaintiff's patent."

A copy from the minutes, as witness my hand and official seal, at Utica, this 15th day of June, A. D. 1855.

[L. S.] AUG. A. BOYCE, *Clerk.*

51 At a special term of the circuit court of the United States of America for the northern district of New York in the second circuit, held in the city of Buffalo in said district, on the 7th day of August, in the year of our Lord one thousand eight hundred and fifty-five.

Present, the honorables Samuel Nelson and Nathan K. Hall, judges.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY.

Ordered, on motion of M'r S. Blatchford, of counsel for plaintiff, M'r C. Daniels, of counsel for defendants, consenting thereto, that the motion for a new trial on the bill of exceptions be denied.

A copy, as witness my hand and official seal.

[L. S.] A. A. BOYCE, *Clerk.*

Circuit court of the United States for the northern district of New York.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY.

This was an action on the case brought by Henry Tanner against the New York and Erie Railroad Company to recover damages for the infringement of letters patent granted to said Tanner on the 6th day of July, 1852, for an "improvement in railroad-car brakes."

The case was tried at the term of this court held at Albany in October, 1854, before his honor, Judge Hall, and a jury. It was defended on the ground of want of novelty, but the jury found a verdict, on the facts presented, for the plaintiff.

The defendants took a bill of exceptions on said trial for alleged errors in the charge of the court to the jury, and the motion for a new trial on such bill of exceptions came on to be heard before a special term of this court held at Buffalo on the 7th of August, 1855, before his honor Judge Nelson, one of the associate justices of the Supreme Court of the United States, and his honor Judge Hall, district judge; whereupon the said bill of exceptions was abandoned by the defendants, and, by consent of their counsel, the motion for a new trial was denied. The defendants thereupon paid in full the judgment which was entered on said verdict for damages and costs, and also paid for and took a
53 license under said patent for the residue of its term, and paid for past infringements not covered by said verdict.

We understand from the attorney and counsel who had charge of the suit that the above facts are correct.

August 14, 1855.

EATON & DAVIS,
Attorneys for New York and Erie Railroad Co.

Circuit court of the United States for the northern district of New York.

HENRY TANNER
vs.
THE HUDSON RIVER RAILROAD COMPANY.

This was a suit brought by the plaintiff for an alleged infringement of letters patent granted to him as assignee of the inventors, L. F. Thompson and A. G. Bachelder, for an improved railroad-brake, by the use on said road of brakes made on plans alleged to have been invented by Nehemiah Hodge, and also by F. A. Stevens, and purchased by the defendants from the said Hodge and Stevens, and also for the use of the plan as patented to the said Tanner.

The suit was noticed for trial at the October term of 1853, and put over the term by motion of defendant's counsel, by paying the costs of the term.

And thereafter the defendant's counsel made overtures for a settlement, which resulted in the defendant's acknowledging the validity of plaintiff's patent, the infringement of the said patent by 54 the use of double-acting brakes on the plans of the said patents, and the company paying to the said plaintiff for the right to use the said invention, and for the withdrawal of the said suit, the sum of one thousand dollars and costs.

Having read the above, I do certify to the correctness of the statements therein contained.

October 25, 1853.

THOMAS M. NORTH,
Secretary and Attorney of the Hudson River Railroad.

(Endorsed:) Filed Dec. 28, 1861. W'm H. Bradley, clerk.

Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY Company. } In chancery.

The answer of said defendant, the Chicago & Northwestern Railway Company, to the bill of complaint of said complainant, Thomas Sayles.

This defendant, now and at all times hereafter saving and reserving to itself all manner of benefit and advantage of exception to the manifold errors and insufficiencies in the complainant's bill of com- 55 plaint contained, for answer thereto, or to so much and such parts thereof as this defendant is advised are material for it to make answer unto, answering, saith:

That this defendant admits itself to be a corporation for railroad purposes, created and existing under the laws of the States of Illinois and Wisconsin, and owning and operating a railroad from said city of Chicago, in the northern district of Illinois, to Appleton, in the State of Wisconsin, being a distance of two hundred and thirteen miles.

And this defendant, further answering, saith that it is not informed, save by said bill of complaint, and cannot therefore either admit or deny, whether said Thompson and Bachelder were, at the time mentioned in said bill, or at any other time, the original and first inventors of the pretended new and useful improvement in railroad car-brakes in said bill of complaint mentioned and referred to; nor whether the said Thompson and Bachelder assigned and transferred to said Henry Tanner all their rights, title, and interest to said improvement prior to the granting of letters patent therefor as in said bill set forth; nor whether letters patent securing to said Tanner, his heirs, administrators, and assigns, the full and exclusive right of making, constructing, using, and vending the said pretended improvement, were issued under the seal of the Patent Office of the United States to said Tanner, at the time and in the manner mentioned in said bill of complaint; nor whether, in obtaining the issue of said letters patent, said Tanner and said Thompson & Bachelder complied with the laws of the United States relative to the granting of patents, and with the rules and regulations of the Patent Office of the United States; but as to all matters pertaining to obtaining of said letters patent, and the assignment thereof from said Bachelder & Thompson to said Tanner, this defendant insists upon full proof.

56 And this defendant, further answering, saith that it is not informed, save by said bill, and cannot either admit or deny, whether the said Exhibit A, annexed to said bill of complaint, and made a part thereof, is a true copy of said letters patent and the schedules thereto annexed; but this defendant insists upon due production and proof of said pretended original letters patent on the hearing of this case.

And this defendant, further answering, saith that it is not informed, save by said bill of complaint, and cannot either admit or deny, whether said Tanner, at the time mentioned in said bill, or at any other time, commenced an action on the case in the circuit court of the United States for the northern district of New York against the New York and Erie Railroad Company, nor whether the defenses and proofs were set up and made in said case, and trial and judgment had therein, as set forth in said bill; nor is this defendant informed whether the said New York and Erie Railroad Company took a bill of exceptions and made a motion for a new trial in said action on the case, and subsequently abandoned the same, and suffered said motion for a new trial to be overruled; nor is this defendant informed, save by said bill, and therefore it cannot either admit or deny, whether said complainant filed his bill in equity in said circuit court for the northern district of New York, against said New York and Erie Railroad Company, to restrain said company from violating the rights secured to said Tanner, his heirs, executors, administrators, and assigns, by said pretended "letters patent," nor whether such proceedings were had in said cause as are in said bill alleged; nor whether, by reason of said proceedings, said New York and Erie Railroad Company were frightened into a compromise with said complainant, as is by said bill alleged and pretended.

57 And this defendant, further answering, saith that it is not informed, save by said bill, and cannot therefore either admit or deny, whether said Tanner brought an action on the case in the circuit court of the United States for the northern district of New York, against the Hudson River Railroad Company, for an infringement of

said letters patent, nor whether, by reason of said suit, a compromise was effected between said Tanner and said Hudson River Railroad Company, as in said bill is pretended and alleged.

And this defendant, further answering, saith that it is not informed, save by said bill, and cannot therefore either admit or deny, whether the various railroad companies in said bill mentioned, or any of them, have purchased from said Tanner and said complainant the right to use said pretended patented invention, and now use the same; but this defendant insists upon full proof of said matters and allegations.

And this defendant, further answering, denies that by the said pretended verdict in the said action on the case, brought by said Tanner against said New York and Erie Railroad, and by the said alleged settlements and licenses and purchases and uses of said pretended improvement the validity of said letters patent, and the novelty and utility of said pretended improvement, and the fact that the use of the said Hodge and Stevens brake is a violation of said letters patent, is fully established and settled; but, on the contrary, this defendant insists and charges the fact to be, upon information and belief, that said judicial proceedings, if any such were had, were had by collusion between said Tanner, or parties acting in his behalf, and the said New York and Erie Railroad Company, or some one acting in its behalf, and the said Hudson River Railroad Company, or some one acting in its behalf; that said trial was not had in good faith, and with the intent of vigorously contesting and defeating the validity of said pretended patent
58 of said Tanner; and that the said pretended sales of the right
to use said pretended invention, and the purchase thereof by the various railroad companies mentioned in said bill, were not made in good faith, with the intention, on the part of the purchasers, to use said pretended improvement, but that said sales and purchases, if made at all, were made upon and for a nominal consideration, and to avoid litigation, or the threat and danger thereof, and to be rid of the annoying and vexatious importunities of said Tanner and said complainant; and this defendant denies that the said judicial proceedings, or the said pretended settlements or licenses, in said bill alleged, are or should be taken or deemed as any evidence, admission, or determination as to the validity of said letters patent, or the novelty or usefulness of said pretended invention, or that the use of the Hodge or Stevens brake is a violation and infringement of said letters patent.

And this defendant, further answering, saith that it is not informed, save by said bill, and cannot therefore either admit or deny, whether the said interest in said pretended patented invention, which is by said bill claimed by said complainant, has been duly assigned and transferred to him; but this defendant insists upon the proof of said matters, and of all facts necessary to show that said complainant has the right and title to said pretended invention which is claimed by said bill.

And this defendant, further answering, denies that it is now or has at any time since the first day of June, 1859, been using and operating, or causing to be used or operated, upon cars running upon its railroad, within the States of Illinois and Wisconsin, or upon any other railroad, brakes constructed in accordance with the description contained in said letters patent to said Tanner.

And this defendant, further answering, denies that the brakes
59 known as "Hodge's Brake" and "Stevens' Brake" embody and
contain the invention and improvement claimed in the said letters patent to the said Tanner.

And this defendant, further answering, insists and charges the fact to be, that car-brakes combining the substantial principle, mode of operation, and result of the said pretended improvement of said Tanner, were publicly known and in use long prior to that of the pretended invention by said Thompson and Bachelder. That the essential principles contained in the said pretended invention of said Bachelder and Thompson were known and publicly used by one James Millholland, in 1842, upon the Baltimore and Susquehanna Railroad, in the State of Maryland; by one Willard J. Nichols, in 1846, upon the New Haven, Hartford & Springfield Railroad; by one Charles B. Turner. formerly of Brooklyn, but afterwards of Buffalo, in the State of New York, in 1846, long prior to the pretended invention of said Bachelder and Thompson; by Joseph H. Moore, upon the "Old Colony Railroad" in the State of Massachusetts, in 1846; and by divers other persons and railroad companies in the United States, and elsewhere.

And this defendant, further answering, denies that said complainant has, by the use of any car-brakes upon the cars of this defendant, been damaged or injured to the extent alleged in said bill of complaint, or to any extent.

And this defendant, further answering, saith that it is not now, and has not been since the first day of June, 1859, using upon its cars in said States of Illinois and Wisconsin, or elsewhere, any car-brakes known as Tanner brakes, nor any car-brakes known as Hodge or Stevens brakes, constructed upon the principle of the said Tanner specification. That said defendant is using upon its cars the brake known as the single brake, and a brake constructed upon the principles embodied in the specifications of a patent granted to one Charles B. Turner, long
60 prior to the patent of said complainant, and essentially different therefrom.

And this defendant, further answering, says that it is informed and believes, and charges it to be true, that before the issue of said letters patent, said Thompson and Bachelder had abandoned their said pretended invention to the public. That said letters patent were obtained wrongfully and fraudulently by the said Tanner; and this defendant denies, that the use of car-brakes constructed and operated in the manner substantially as set forth in the specifications and according to the directions of said letters patent, and the schedule accompanying the same, so as aforesaid claimed to have been issued to said Tanner and assigned to said complainant, without the license and consent of said complainant, is a violation or infringement of any rights secured by said letters patent, because of the said abandonment thereof by said Thompson and Bachelder, and the fraud in obtaining the issue of said letters patent to said Tanner; and also for want of novelty in said pretended invention.

And this defendant denies all unlawful combination and confederation in said complainant's bill charged, without this, that any other matter or thing material or necessary for this defendant to make answer unto, and not herein or hereby well or sufficiently answered unto, confessed or avoided, traversed or denied, is true, to the best knowledge or belief of this defendant.

All which matters and things this defendant is ready to aver, maintain, and prove, as this honorable court shall direct; and humbly prays to be herein dismissed with its reasonable costs in this behalf most wrongfully sustained.

In testimony of all which said defendant hath hereto affixed its corporate seal, and caused the same to be attested by J. B. Redfield, its assistant secretary.

Attest.

[L. S.] **J. B. REDFIELD,**
Assistant Secretary.

BLODGETT & WINSTON,
Sol'rs for Defendant and of Counsel.

(Endorsed:) Filed March 4, 1862. W'm H. Bradley, clerk.

61 And on the same day, to wit, the 17th day of March, A. D. 1873, in the record of proceedings of said court in said entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILroad Company. } **Chancery.**

Now comes the complainant, by his solicitor, and moves the court, upon petition filed, for leave to restore the pleadings and proofs heretofore filed herein and destroyed by fire on the ninth of October, eighteen hundred and seventy-one; and thereupon, by agreement of the parties, by their solicitors, as per stipulation filed, it is ordered by the court that Exhibit A, being a copy of the original bill, answer, and defendant's testimony, taken before the first hearing; Exhibit B, being a copy of the complainant's testimony (except documentary) taken before first hearing; Exhibit C, being a copy of the complainant's new proofs taken after decree was opened; Exhibit D, being a copy of the first decree; Exhibit E, being a copy of the second decree; and Exhibits F and G, being a copy of defendant's new proofs, taken before opening of the decree, be filed and substituted for and have the same effect as the originals so destroyed.

62 Afterwards, to wit, on the 18th day of March, A. D. 1873, in the record of the proceedings of said court in said entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILroad Company. } **Chancery.**

Now come the parties, by their attorneys, and on motion of the complainant, by his solicitor, and as per stipulation filed, it is ordered that the defendant close its proofs herein by the twenty-third day of April next.

63 Amended answer of the defendants in said entitled cause, filed March 17, A. D. 1873, by leave of court.

64 *Amended answer.*

United States circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY Company. } In chancery.

The amended answer of the Chicago & Northwestern Railway Company, defendant, to the bill of complaint of Thomas Sayles, complainant.

This defendant, by way of amendment to its original answer heretofore filed in said cause, by leave of court firsthad and obtained, further answering, says, on information and belief, that said Batchelder & Thompson were not the first and original inventors of the invention or improvement described in the said letters patent in said bill mentioned, but that said invention and improvement, and substantial and material parts thereof claimed as new, were, long prior to said pretended invention thereof by said Batchelder & Thompson, in use on the following railroads in the United States, and known to be so used by the persons hereinafter named, to wit: On the Camden & Amboy Railroad, in the State of New Jersey, and known to be so used by George W. Thompson, Nicholl F. Smith, Edwin Lockwood, & William Venable, residing in Bordentown, in New Jersey, and by many others who were employed on or connected with said road; and in such use also on 65 the cars of the New Jersey Railroad & Transportation Company, in said State of New Jersey, and known to be so used by Joseph F. Tallson, of Hudson City, New Jersey, and John H. Jobes, of Jersey City, and James T. Gamble, of Newark, all in said State, and by many others who were employed on or connected with said railroad. And this defendant therefore says that said letters patent are and were null and void.

THE CHICAGO & NORTHWESTERN RAILWAY COMPANY,
By H. W. BLODGETT, *its Solicitor.*
H. W. BLODGETT,
Def't's Solicitor and of Counsel.

Replication to amended answer.

THOMAS SAYLES
v.
THE CHICAGO & NORTHWESTERN RAILWAY Company. }

The replication of Thomas Sayles, complainant, to the amended answer of the Chicago & Northwestern Railway Company, defendant.

This repliant, saving and reserving to himself all and all manner of advantage of exception to the manifold insufficiencies of said amended answer, for replication hereto saith that he will aver and prove his said bill to be true, certain, and sufficient in the law to be answered unto, and that said amended answer is uncertain, untrue, and insufficient 66 to be replied unto by this affiant; without this, that any other matter or thing whatsoever, in said answer contained, material or effectual in the law to be replied unto, confessed or avoided, traversed or denied is true. All which matters and things this repliant is & will be ready to aver & prove as this honorable court shall direct, & humbly prays as in and by his said bill he has already prayed.

It is hereby stipulated that the within amended answer and replication be filed as of the first day of March, 1867, nunc pro tunc.

GEORGE PAYSON,
Solicitor for Def't.
WEST & BOND,
Sol'rs for Comp't.

(Endorsed:) Filed March 17, 1873, as of the 1st day of March, '67, nunc pro tunc, by leave of court. W'm H. Bradley, cl'k.

67 Exhibit D, referred to in the petition to restore record, and marked "Filed March 17, A. D. 1873."

68 EXHIBIT D.

In the circuit court of the United States for the northern district of Illinois.

MONDAY, *March* 6, 1865.

The Hon. Thomas Drummond, district judge.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } Chancery.

This cause having been heretofore brought to a hearing upon the pleadings and proofs, and counsel for the parties respectively having been heard thereupon, and the same having been duly considered by the court, it is found—

First. That the patent granted to Henry Tanner, dated the sixth day of July, one thousand eight hundred and fifty-two, in the bill set forth, is valid, and that the said Henry Tanner thereby became vested with the exclusive right thereby granted; as in said bill alleged and claimed.

Second. That the said complainant, by virtue of lawful assignments bearing date the twenty-third day of January, in the year one thousand eight hundred and fifty-five, and April fourth, eighteen hundred and fifty-nine, made and executed by the said Henry Tanner to the said complainant, became and is vested with all the right, title, interest, 69 and claim of the said Tanner in and to the said patent, and to all damages and profits and rights of action for the same, either in law or equity, growing out of the use, or unlawful use, manufacture, or vending of the said patent and invention, which occurred between the issuing of said letters patent and the date of said assignment, together with the unexpired term of the said invention covered by said letters patent, so far as relates to the territory covered by the claims in said bill.

Third. That the defendant, The Chicago and Northwestern Railroad Company, a corporation created and existing by and under the laws of the State of Illinois, and domiciled within the northern district of Illinois, both disturbed, violated, and infringed upon the said complainant in his exclusive rights under said patent and assignment as aforesaid, as in said bill set forth.

Fourth. That the complainant is entitled to a discovery and account from the defendants, The Chicago and Northwestern Railroad Company, of the profits and gains had and received by said defendants, constituting the damages sustained by the said complainant in consequence of the infringement and violation of the exclusive rights of the complainant which it is adjudged have been so committed by the defendants.

Fifth. That it be, and is hereby, referred to Henry W. Bishop, j'r,
esq., one of the masters of this court, to compute and ascertain
70 and state an account of the profits and gains so had and received
by the defendants, constituting the damages sustained by the
complainant by reason of the infringement aforesaid to the date of said report; and the said master is directed to take the proofs, and report the same to this court with all convenient speed; and he is hereby authorized to require the production of the books of account, and other books of the said defendants on such reference, and to examine the officers and agents of the said defendants on oath touching the matters hereby referred to him. And the proofs already taken in said cause, or agreed to be used by stipulation therein, may also be used in said reference, and also other testimony to be taken under the amendment to the sixty-seventh rule in equity; and all further directions are reserved until the coming in of said report.

71 Exhibit E, referred to in the petition to restore record, and marked "Filed March 17, A. D. 1873."

72 EXHIBIT E.

In the circuit court of the United States for the northern district of Illinois.

TUESDAY, *July* 18, 1871.

Present, the honorable Thomas Drummond, circuit judge.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } Chancery.

This cause having heretofore been brought to a hearing upon pleadings and proofs before the Hon. Thomas Drummond, one of the judges of said court, and an opinion rendered therein deciding that the letters patent on which this suit is brought, granted on the sixth day of July, eighteen hundred and fifty-two, to Henry Tanner, as the assignee of Asahel G. Batchelder and Lafayette F. Thompson, for an improvement in railroad-car brakes, were good and valid; and that the defendants, The Chicago and Northwestern Railroad Company, had infringed the said letters patent by the use upon their cars of the car-brake known as the "Stevens" brake; and an interlocutory decree having, on the sixth day of March, eighteen hundred and sixty-five, been duly entered in said cause in accordance with the said opinion, and decreeing that the
said letters patent were good and valid as aforesaid, and that the
73 said defendants had, as aforesaid, infringed the same, and referring
the cause to Henry W. Bishop, junior, esq., one of the masters of
said court, to, among other things, compute and ascertain and state an account of the profits and gains received by the said defendants by reason of their infringement aforesaid of the said letters patent; and the

said interlocutory decree having, on the petition of the said defendants, been opened and set aside on the twenty-seventh day of May, eighteen hundred and sixty-seven, to enable the defendants to take and submit to the court certain evidence which they claimed in said petition to be newly discovered, and which they further claimed would prove the said letters patent to be invalid for want of novelty in the said invention of the aforesaid Batchelder and Thompson; and the said cause having heretofore again been brought to a hearing before the aforesaid Thomas Drummond, circuit judge, on additional proofs, the same constituting the aforesaid newly discovered evidence on the part of the said defendants, and at the same time the aforesaid issue of infringement having, upon the express application of the said defendants, been again brought before the said court for determination, and the Hon. B. R. Curtis and the Hon. H. W. Blodgett having been heard upon the said issues on the part of the said defendants, and Samuel D. Cozzens, esquire, having been
74 heard thereon on the part of the above-named complainant, and the said additional proofs and the said issue of infringement having been duly and fully considered by the said court:

Now, therefore, it is hereby ordered, adjudged, and decreed herein, as follows:

First. That the aforesaid letters patent, on which this suit is brought, granted on the sixth day of July, eighteen hundred and fifty-two, to Henry Tanner, as the assignee of Asahel G. Batchelder and Lafayette F. Thompson, for an improvement in railroad car-brakes, are good and valid.

Second. That the said Asahel G. Batchelder and Lafayette F. Thompson were jointly the original and first inventors of the combination of the brakes of a railroad car with the operative windlasses, so that the brakeman, by operating either windlass, can apply all the brakes of the car simultaneously to the wheels of the car.

Third. That the said Batchelder and Thompson never neglected or abandoned the said invention, and that the said Henry Tanner, by the said grant of the said letters patent, became and was vested with the sole and exclusive right and liberty of making, using, and selling to others to be used, the said invention throughout the United States for the whole of the first term of said letters patent.

Fourth. That under and by virtue of the several assignments set forth in the bill in this cause, made and executed by the aforesaid Henry
75 Tanner to the said complainant, Thomas Sayles, to wit, the assignment of the thirteenth day of July, eighteen hundred and fifty-four, and the assignment of the twenty-third day of January, eighteen hundred and fifty-five, and the assignment of the fourth day of April, eighteen hundred fifty-nine, the said complainant became and is vested with the entire right, title, and interest under the aforesaid letters patent for the first term thereof, and also in and to all damages, gains, profits, and savings, together with all rights of action for the same, both in law and equity, growing out of the infringement, or violation, or the unlawful making, using, and vending of the aforesaid invention within and throughout the territory included in the said assignments for the period between the aforesaid granting of the said letters patent and the dates of the said assignments, respectively, together with the residue, from and after the said dates, of the said assignments of the said first term of said letters patent.

Fifth. That the said letters patent properly and sufficiently describe and claim the aforesaid invention of the said Batchelder and Thompson, and that the thing patented and covered in and by the said letters patent

is the combination of all the brakes of a railroad car with the operative windlasses on the car, so that the brakeman, by operating either of
76 these windlasses, can apply simultaneously all the brakes of the car to the wheels of the car.

Sixth. That the car-brake known as the "Stevens" brake, used by the defendants in this cause, embodies and contains the aforesaid combination patented and covered in and by the said letters patent on which this suit is brought, granted to the aforesaid Henry Tanner, as assignee as aforesaid, on the sixth day of July, eighteen hundred and fifty-two.

Seventh. That the said defendants, the said The Chicago and Northwestern Railroad Company, by the use of the said "Stevens" car-brake, have violated and infringed upon the aforesaid rights of the said complainant under the said letters patent and under the aforesaid assignments.

Eighth. That the said complainant is entitled to a discovery and account from the said defendants of all the gains, profits, savings, benefits, and advantages accruing to and realized and received by the said defendants in consequence of their aforesaid violation and infringement of the said letters patent and their aforesaid unlawful use of the said invention, together with damages for the said infringement and unlawful use; and it is further hereby ordered that this cause be referred to Henry W. Bishop, esquire, one of the masters of this court, to compute and ascertain and to take and state an account of all the gains,
77 profits, savings, benefits, and advantages accruing to and realized and received by the said defendants, The Chicago and Northwestern Railroad Company, in consequence of their use in the aforesaid "Stevens" car-brake of the aforesaid invention of the said Batchelder and Thompson, patented in and by the said letters patent from the time of the commencement of such use by them subsequent to the grant of the said letters patent down to the date of such report, and in addition thereto to assess, under the direction of the court, the damages sustained by the complainant by reason of the said use and infringement by the said defendants for the period aforesaid.

And the said master is hereby directed to take proofs upon the abovementioned matters, and to report the same, together with the said account and damages to this court with all convenient speed.

And he is hereby authorized to require the production before him upon this reference of the books of account and the other books of the said defendants, and to examine the officers, agents, and employees of the said defendants on oath touching the said matters hereby referred to him; and it is further ordered that the stipulations heretofore made and executed by the said defendants upon the reference to the said master, ordered by the above-mentioned interlocutory decree of
78 the sixth day of March, eighteen hundred and sixty-five, together with all material and relevant testimony heretofore taken by the said defendants or by the said complainant before the said master upon said previous reference, or otherwise, in said cause, may be used in the reference hereby ordered, and also any other testimony to be taken before him under the amendment to the sixty-seventh rule in equity; and all further directions are reserved until the coming in of the said report.

(Endorsed:) Filed March 17, 1873. W'm H. Bradley, cl'k.

79 Report of Henry W. Bishop, master, to whom this cause was referred, and the exceptions filed thereto by said defendant.

80 *Master's report.*

Circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD COMPANY.
} In chancery.

To the honorable the judges of said court:

This cause having been by an interlocutory decree of the court referred to the undersigned, as master, to compute and ascertain, and to take and state an account of, all the gains, profits, savings, benefits, and advantages accruing to, realized and received by the said defendants, the Chicago and Northwestern Railroad Company, in consequence of their use, in the Stevens car-brake, of the invention of Batchelder and Thompson (in said decree described) patented in and by the letters patent described therein—from the time of the commencement of such use by them subsequent to the grant of said letters patent down to the date of such report—and in addition thereto to assess, under the direction 81 of the court, the damages sustained by the complainant by reason of the said use and infringement by the said defendants during the period aforesaid—

I hereby report that I have been attended by S. D. Cozzens, esq., solicitor for complainant, and Hon. John N. Jewett, solicitor for defendants, who have produced before me the testimony taken in said cause, together with the stipulations therein.

And upon the hearing of the arguments, and examination of the evidence in said cause together with the stipulations therein, I find that the complainant is entitled to have and receive from the said defendants for his damages herein—the same being the amount of value of the gains, profits, savings, benefits, and advantages which I find were realized by the defendants by reason of the use and infringement by them of the said patent of the complainant for the period of five years—beginning June 2d, 1859, and ending June 2d, 1864—the sum in gross of sixty-three thousand six hundred and thirty-eight dollars and forty cents ($63,638.40).

The elements that make up this account consist of two parts:

First. In the saving in the wages of brakemen, amounting to the sum of forty-one thousand two hundred and eighty dollars ($41,280).

Second. In the saving in wheels, amounting to twenty-two thousand three hundred and fifty-eight dollars and forty cents ($22,358.40).

The duration of the use of complainant's patent, the number of cars upon which it was used, the number of brakemen employed and their wages, the number of wheels upon each car, the cost of the wheels and the expense of putting on a set of wheels under each car, are all the subject of stipulation, leaving the other items in the account to be established by the testimony.

As to each one of these elements I have made out and attach hereto a detailed statement, marked "Exhibit A," which will show the processes by which the results herein stated are obtained.

82 In arriving at my conclusions I have computed the amount saved to the defendants by the use of the Batchelder and Thompson invention over the use of the "single brake," rejecting as a standard of comparison what is known in this cause as the "Springfield brake," it appearing to me from the testimony that said brake was an unsuccessful, abandoned experiment, and not a perfected practical invention.

The proofs in the case show that prior to Bachelder and Thompson's invention it was put upon two "crate-cars," used a short time, and then taken off and the "single brake," which had previously been used on the same cars, put back in its place. It also appears that after Batchelder and Thompson invented their brake the "Springfield brake" was twice again attempted to be used on passenger-cars and was each time abandoned. The last of these times—when used between New York and Boston—accidents were caused by it. In addition to this, the clear weight of the evidence, to my mind, is that it is a defective brake and not adapted to ordinary every-day practical use on passenger-trains.

It is insisted by complainant that in the use of the single brake a necessity arises for reversing the engines in order to stop the trains, and that this is injurious to the engines; and damages to engines arising from this cause are sought to be recovered in this proceeding. I am of the opinion that this should not be allowed, for the reason that the increase of brakemen covers (in my judgment) this item; for if the brakemen are increased so as to enable them to apply the brakes to all the trucks of a train without passing through the cars, the necessity for reversing the engines seems to me to be wholly obviated.

I have therefore rejected this item from the account.

Exhibit A.

First, brakemen saved:

For five years defendants ran constantly in passenger-trains
83 twenty-four (24) cars, and required therefor twelve (12) brakemen
and four (4) baggagemen, equaling in all sixteen (16) brakemen.

The use of the patent is shown to have saved an equal number—that is, sixteen (16).

It is shown that on mixed trains defendants ran two (2) cars, and required therefor one (1) baggageman, equaling one (1) brakeman.

The use of the patent saved here two (2) brakemen.

On freight-trains they ran two (2) "caboose-cars," requiring therefor two (2) brakemen (or conductors).

The patent saved here two (2) brakemen.

Making in all twenty (20) brakemen saved.

The average wages of a brakeman for the time the patent was used were thirty-four dollars and forty cents ($34.40) per month.

Wages of 20 brakemen would be $688 per month.

Wages of 20 brakemen would be $8,256 per year.

Wages of 20 brakemen for five years, $41,280.

I do not take into account the forward truck of the forward car of either of the defendants' passenger-trains, which were four in number.

If the forward trucks were counted, the brakemen saved would be twenty-four (24) instead of twenty (20).

Nor are the Harvard and Rockford mixed trains taken into account, which ran one year of the five, and on which two (2) brakemen were saved by the patent.

Second, wheels saved:

For five (5) years defendants ran constantly in passenger-trains
twenty-four (24) cars.
84 On mixed trains they ran two (2) cars.
On freight-trains they ran two (2) "caboose-cars."

On Harvard and Rockford trains they ran for one (1) year two (2) cars.

Equaling thirty (30) cars per year for one year, and twenty-eight (28) cars per year for four years; or,

Calling the wheels saved on the two caboose-cars per year as equaling the wheels saved on one of the other cars per year, it may be stated as:

Twenty-nine (29) cars for one year, and twenty-seven (27) cars for each of the other four years.

The patent saved two (2) setts of wheels per car per year. Equaling fifty-eight (58) setts saved for one year and two hundred and sixteen setts saved for the four (4) years, or in all two hundred and seventy four (274) setts saved in five years.

Cost of a sett of wheels was	$133 60
And of putting on a sett	8 00
Making cost of a sett put on	141 60
Or for the whole 274 setts	38,798 40
Value of old wheels, calling their average weight 500 lbs.	16,440 00
Deducting this amount, there is left for saving in wheels	22,358 40

In this estimate no account is made of any cars except those shown to have been constantly in use.

85 *Summary.*

1st. Saving in brakemen	$41,280 00
2d. Saving in wheels	22,358 40
Total amount due complainant	63,638 40

(Sixty-three thousand six hundred and thirty-eight dollars and forty cents.)

All of which is respectfully submitted.

HENRY W. BISHOP,
Master in Chancery, United States Circuit Court.

JULY 31, 1873.

(Endorsed:) Filed July 31, 1873. W. H. Bradley, clerk.

86 *Exceptions filed by defendant to said report.*

Circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY Company.

Exceptions taken by the defendant in the above-entitled cause to the report made therein by Henry W. Bishop, esq., one of the masters in chancery of said court, to whom said cause was referred by a decree made and entered therein on the 18th day of July, A. D. 1871, and which report bears date the 31st day of July, A. D. 1873.

FIRST EXCEPTION.—For that the said master decided, and in and by his said report stated, that the brake known as the "Springfield brake" was an unsuccessful and abandoned experiment and not a perfected practical invention—in disregard of the testimony of the witnesses William Jennings, Wilson Eddy, Henry W. Snow, John Mulligan, and John B. Adams, as to the successful working of said "Springfield brake," long prior to the alleged invention of Batchelder and Thompson, and which testimony was before said master on said reference.

Second exception.—For that the said master, as appears by his report aforesaid, "computed the amount saved to the defendant by the use of the Batchelder and Thompson invention over the use of the single brake, rejecting as a standard of comparison what is known in this cause as the 'Springfield brake'"—thereby wholly disregarding and refusing to consider the testimony of the witnesses before named in the first exception, and also the testimony of the witnesses Benjamin
87 W. Hobart, James A. Clark, Benjamin Ray, Edward Lang, Benjamin C. Read, Henry Waterman, William O'Brien, George H. Gardner, Alfred Berney, John A. Hearn, V. D. Perry, S. L. F. Deyo, Only L. Smith, Henry F. Sampson, William McCormick, Henry A. Wright, Robert Hitchcock, Alpheus Wing, John D. Emerson, John C. Blood, H. M. Rogers, G. F. Lincoln, John Lightner, James Lyon, Charles Haradon, Henry F. Taylor, John Bartlett, William W. Stevens, Charles W. Marsh, John B. Adams, R. C. Steele, Cornelius Teeling, Lewis A. Sherts, Luther D. Hodgkiss, John A. Smith, John W. Clark, F. D. Adams, and William H. Russell, introduced before said master on said reference by the said defendant, showing the successful working of said Springfield brake as a double brake.

Third exception.—For that the said master, as appears by his report, in estimating the gains, profits, savings, benefits, and advantages accruing to the defendant by the use of the Batchelder and Thompson invention, as set forth in the letters patent to Henry Tanner, wholly disregarded the advantages of the double-acting brake known as the "Springfield brake" over the single brake, as testified to by the defendant's witnesses above named in the first and second exceptions, and made comparison of the said Tanner brake directly with the single brake; whereas, under the testimony aforesaid, the comparison should have been made by him between the Tanner brake and the said "Springfield brake."

Fourth exception.—For that the said master has assumed, and in and by his said report decided, that with single brakes the defendant would have been compelled to employ double the number of brakemen and baggage-men in the management of its trains that it did employ with the double brakes.

Fifth exception.—For that the said master, in the making up of the account between the complainant and the defendant, assumed that by the use of the invention of Batchelder and Thompson, the defendant made a saving of the wages of one-half the number of brakemen upon its passenger-trains; when the fact is, as shown by said report, that the defendant, during all the time covered by said account, used the Stevens brake upon all its passenger-cars.

88 Sixth exception.—For that the said master, in the making and stating of the account between the said complainant and the said defendant, has allowed to the said complainant all the gains, savings, and benefits accruing to the defendant from the use of the best form of double-acting brake; and has not, in any manner, made allowance or deduction therefrom on account of the defects and want of adjustability of the Tanner brake.

Seventh exception.—For that the said master, in estimating the gains, profits, benefits, and advantages derived by the said defendant from the use of double brakes, has not allowed for any difference between that form of double brake known as the Stevens brake, which, as appears by said report, was exclusively used by the said defendant during the time covered by said report, and that form of double-brake claimed to have been invented by Batchelder and Thompson and described in the letters patent to Henry Tanner.

Eighth Exception.—For that the said master has found, and in and by his said report decided, that by the use of the alleged invention of Batchelder and Thompson in the Stevens brake there was a saving to the defendant of two setts of car wheels to each car per year.

Ninth Exception.—For that the said master has found, and in and by his said report decided, that the Batchelder and Thompson invention, embodied in the Stevens brake used by the said defendant, resulted in saving to the said defendant two setts of car-wheels per car per year during the entire time covered by said account—comparing said brake directly with the single brake in order to reach that result, and making no allowance for the imperfections of the said Batchelder and Thompson invention when tested by itself.

Tenth Exception.—For that the said master has assumed, contrary to the facts as shown by the complainant's own witnesses, and in and by his said report has in substance decided, that the use of the Batchelder and Thompson invention prevents the injury of car-wheels by "spotting," and that this cannot be prevented by the use of the single brake.

89 Eleventh Exception.—For that the said master in and by his said report has calculated as the gains, savings, advantages, and benefits accruing to the defendant from the use of the alleged invention of Batchelder and Thompson, not only the saving, in the wages of brakemen, but also the savings in car-wheels, the effect of which is a partial duplication of the actual gains and savings resulting from the use of a double-acting brake.

Twelfth Exception.—For that the said master, in the making and stating of the account between the said complainant and the said defendant, has not based the same upon the actual gains and savings resulting to the defendant from the use of the invention of Batchelder and Thompson, nor upon the testimony before said master as to the use of said invention by said defendant, but, instead thereof, has estimated said gains and savings according to vague and indefinite impressions of certain witnesses, who testified in respect to the supposed savings in car-wheels resulting to other railroad companies from the use of double-acting brakes on their cars.

Thirteenth Exception.—For that the said master, in the said report, wholly disregarded the brake called the "Tender brake," proved by the testimony of Wilson Eddy and others to have been in use continuously since 1843, and long prior to the alleged invention of the Tanner brake, and excluded the same in his comparison of the Tanner brake with prior devices, and made said comparison of said Tanner brake directly with the single brake.

In each and all of which particulars the said defendant excepts to the report of the said master and to his findings therein as erroneous, and appeals therefrom to the judgment of this honorable court.

JOHN N. JEWETT,
Solicitor for said Defendant.

(Indorsed): Filed Aug. 23, 1873. W'm H. Bradley, clerk.

90 NORTHERN DISTRICT OF ILLINOIS, *ss :*

I, William H. Bradley, clerk of the circuit court of the United States for said district, do hereby certify the above and foregoing to be a true, correct, and complete copy of the report of master, filed July 31st, A. D. 1873, and the exceptions to said report filed August 23d, A. D. 1873, in said-entitled cause in said court of Thomas Sayles against the Chicago and Northwestern Railway Company, as appears from their respective originals remaining in my custody.

In testimony whereof I have hereunto set my hand and affixed the seal of said circuit court, at my office in Chicago, in said district, this 26th day of August, A. D. 1873.

[SEAL.] W'M H. BRADLEY, *Clerk.*

91 *Exception filed by complainant to said report.*

U. S. circuit court, northern district of Illinois.

THOMAS SAYLES
v.
THE CHICAGO AND NORTHWESTERN RAILroad Company.
} In chancery.

Exception on the part of the complainant to the report of the master in this cause, filed July 31st, 1873.

The complainant hereby excepts to the report and decision of the master in this cause.

For that the said master in and by his said report refused to allow to the complainant the amount of savings shown by the proofs to have been realized by the defendants from the use of the Batchelder and Thompson invention in respect to injury due to reversing engines in order to stop trains, and that he found and reported that the increase in brakemen covered this item of savings, and that in so doing he disregarded the testimony of the witnesses on the part of the complainant, who were uncontradicted.

WEST & BOND,
Complainant's Solicitors.

(Indorsed :) Filed Aug. 23, 1873. W'm H. Bradley, clerk.

92 Afterwards, to wit, on the 29th day of October, A. D. 1873, in the record of the proceedings of said court in said-entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
v.
THE CHICAGO AND NORTHWESTERN RAILroad Company.
} In chancery.

Now come the parties, by their solicitors, and now comes on to be heard the exceptions of the defendant to the report of the master filed herein, and, after hearing a part of the arguments of counsel, the hour of adjournment having arrived, the further hearing is postponed until Friday morning next.

93 Afterwards, to wit, on the 31st day of October, A. D. 1873, in the record of the proceedings of said court in said-entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

Now come again the parties, by their solicitors, and now comes on further to be heard the exceptions of the defendant to the report of the master filed herein, and after hearing additional arguments of counsel, without concluding the same, the further hearing is postponed until tomorrow morning.

94 Afterwards, to wit, on the 1st day of November, A. D. 1873, in the record of the proceedings of said court in said-entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

Now come again the parties, by their solicitors, and now comes on further to be heard the exceptions of the defendant to the report of the master filed herein, and after hearing additional arguments of counsel, without concluding the same, the further hearing is postponed until Monday next.

95 Afterwards, to wit, on the 3d day of November, A. D. 1873, in the record of the proceedings of said court in said-entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

Now come again the parties, by their solicitors, and now comes on further to be heard the exceptions of the defendant to the report of the master filed herein, and after hearing the concluding arguments of counsel the court, not being sufficiently advised in the premises, takes the same under advisement.

96 And afterwards, to wit, on the 22d day of December, A. D. 1873, in the record of the proceedings of said court in said-entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

This cause having, in December, A. D. eighteen hundred and sixty-three,

been brought to a hearing upon pleadings and proofs before the Hon. Thomas Drummond, one of the judges of said court, and having afterwards, in May, A. D. eighteen hundred and sixty-nine, been reheard upon further proofs before the said judge, and an interlocutory decree having been entered herein on the eighteenth day of July, A. D. one thousand eight hundred and seventy-one, whereby it was, among other things, ordered, adjudged, and decreed that the defendants, the said The Chicago and Northwestern Railroad Company, by the use of the Stevens car-brake, had violated and infringed upon the rights of the said complainant under the letters patent on which this suit is brought, granted on the sixth day of July, A. D. eighteen hundred and fifty-two,
to Henry Tanner, as the assignee of Asahel G. Batchelder and
97 Lafayette F. Thompson, for an "improvement in railroad car-
brakes, and under the assignments set forth in the bill of complaint herein," and that the said complainant was entitled to a discovery and account from the said defendants of all the gains, profits, savings, benefits, and advantages accruing to and realized and received by the said defendants in consequence of their aforesaid violation and infringement of the said letters patent and their aforesaid unlawful use of the said invention, together with damages for the said infringement and unlawful use, and that this cause be referred to Henry W. Bishop, esq., one of the masters of said court, to compute and ascertain, and to take and state an account of, all the gains, profits, savings, benefits, and advantages accruing to, and realized and received by, the said defendants in consequence of their use in the aforesaid Stevens car-brake of the aforesaid invention of the said Batchelder and Thompson, patented in and by the said letters patent, from the time of the commencement of such use by them down to the date of such report, and the said master, in pursuance of the said interlocutory decree, having, on the thirty-first day of July, eighteen hundred and seventy three, filed in said court his report in this cause; whereby he reported and found that the complainant is entitled to have and receive from the said defendants, for his
damages herein, the same being the amount or value of the gains,
98 profits, savings, benefits, and advantages which he found were
realized by the defendants by reason of the use and infringement by them of the said patent of the complainant, the sum in gross of sixty-three thousand six hundred and thirty-eight dollars and forty cents.

And the said defendants having duly filed exceptions to the said report, and the said exceptions having been brought to a hearing before the said court, and counsel having been heard thereon on behalf of the respective parties, and the said exceptions having been overruled by the court, and the court having decided that the said report ought to be confirmed:

Now, therefore, it is hereby ordered, adjudged, and decreed herein as follows:

First. That the aforesaid letters patent on which this suit was brought, granted on the sixth day of July, A. D. eighteen hundred and fifty-two, to Henry Tanner, as the assignee of Asahel G. Bachelder and Lafayette F. Thompson, for an improvement in railroad-car brakes, are good and valid.

Second. That the said Asahel G. Batchelder and Lafayette F. Thompson was jointly the original and first inventors of the combination of the brakes of a railroad-car with the operative windlasses, so that the brakeman by operating either windlass can apply all the brakes of the
car simultaneously to the wheels of the car.

99 Third. That the said Batchelder and Thompson never neglected

or abandoned the said invention, and that the said Henry Tanner, by the grant of the said letters patent, became and was vested with the sole and exclusive right and liberty of making, using, and selling to others to be used, the said invention throughout the United States for the term for which said letters patent were granted.

Fourth. That under and by virtue of the several assignments set forth in the bill in this cause, made and executed by the aforesaid Henry Tanner to the said complainant Thomas Sayles, to wit, the assignment of the thirteenth day of July, A. D. eighteen hundred and fifty-four, the assignment of the twenty-third day of January, A. D. eighteen hundred and fifty-five, and the assignment of the fourth day of April, A. D. eighteen hundred and fifty-nine, the said complainant became and is vested with the entire right, title, and interest under the aforesaid letters patent for the term for which said letters patent were granted, and also in and to all damages, gains, profits, and savings, together with all rights of action for the same, both in law and in equity, growing out of the infringement or violation or the unlawful making, using, and vending of the aforesaid invention, within and throughout the territory included in the said assignments for the period between the aforesaid granting of the said letters patent and the dates of the assign-
100 ments, respectively, together with the residue from and after the
said dates of the said assignments of the term for which said letters patent were granted.

Fifth. That the said letters patent properly and sufficiently describe and claim the aforesaid invention of the said Batchelder and Thompson, and that the thing patented and covered in and by the said letters patent is the combination of all the brakes of a railroad-car with the operative windlasses on the car so that the brakeman by operating either of these windlasses can apply simultaneously all the brakes of the car to the wheels of the car.

Sixth. That the car-brake known as the Stevens brake used by the defendants in this cause embodies and contains the aforesaid combination patented and covered in and by the said letters patent on which this suit is brought, granted to the aforesaid Henry Tanner, as assignee as aforesaid, on the sixth day of July, A. D. eighteen hundred and fifty-two.

Seventh. That the said defendants, the said The Chicago and Northwestern Railroad Company, by the use of the said Stevens car-brake have violated and infringed upon the aforesaid rights of the said complainant under the said letters patent and under the aforesaid assignments.

Eighth. That the said complainant do recover of the said defendants the amount so as aforesaid reported and found by the said master as being the amount of the gains, profits, savings, benefits, and advantages accruing to and realized and received by the said defendants in
101 consequence of the aforesaid violation and infringement of the
said letters patent, and their aforesaid unlawful use of the said invention, that is to say, the sum of sixty-three thousand six hundred and thirty-eight dollars and forty cents, together with   dollars and   cents for costs and disbursements herein, making in the whole the sum of   dollars and   cents, and that the said complainant have execution therefor.

And thereupon the defendant by its solicitors prayed an appeal to the Supreme Court of the United States, which is allowed by the court upon giving bond according to law.

102 Afterwards, to wit, on the 20th day of February, A. D. 1874,
in the record of the proceeding of said court in said-entitled cause

before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

On motion of George Payson, esq., solicitor for defendant, leave is granted by the court to said defendant to file its petition to set aside the decree herein, together with affidavits in support of the same.

103 Afterwards, to wit, on the 20th day of February, A. D. 1874, said defendant, by its solicitor, filed in said clerk's office its petition in said-entitled cause, which said petition, with the affidavits accompanying the same, are in the words and figures following, to wit:

In the United States circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company. } In chancery.

To the honorable judges of the circuit court of the United States for said district.

And now comes the said defendant, the said Chicago and Northwestern Railway Company, by George Payson, its solicitor, and petitions this honorable court to set aside the decree heretofore, to wit, on the twenty-second day of December, 1873, entered in said cause against said defendant, and the several interlocutory decrees entered prior to thereto, and to grant a rehearing of said cause, and here assigns the following special matters or causes on which said hearing is applied for:

First. By said interlocutory decree entered in said cause on the 18th day of July, 1871, the master to whom said cause was referred was directed to compute and ascertain and to take and state an account of all the gains, profits, savings, benefits, and advantages accruing to and 104 realized and received by said defendants in consequence of their use of the said invention, &c., &c., and in addition thereto to assess, under the direction of the court, the damages sustained by the complainant by reason of said use and infringement by said defendants. Whereas, your petitioners say that said damages should not have been computed by said master nor allowed by the court, nor should they have been allowed in any way to enter into or control or influence said computation and account.

Second. Your petitioner further shows unto your honors that it was expressly stipulated in said cause that nearly all of the wheels that had become "spotted" or flattened on defendant's road during the time covered by said accounting and decree were put under freight-cars at the end where no brakes were applied; yet notwithstanding said stipulation, and in total disregard thereof, and to the manifest injury and wrong of your petitioner, all of such wheels are treated and considered in the said report of the said master as good for nothing but old iron, and are credited to your petitioner accordingly at 1¼ cents a pound, and said final decree follows the same rule.

Third. Your petitioners further show unto your honors that in the said report and said final decree your petitioners are charged with the sum of $450 and over as the amount saved by your petitioners on each car per year by the use, as it is claimed, of the said improvement
105 described in said patent to Batchelder and Thompson; that the
average number of passenger-cars running upon all the railroads in the United States during the fourteen years covered by said patent, as drawn from "Manual of Railroads of the United States for 1873–'4," prepared by H. V. Poor, was about 4,500; that $450 a year for one car would yield $2,000,000.00 and upwards for 4,500 cars, and for the whole 14 years of the patent over $28,000,000. That the seven years covered by the extension of said patent would, as appears from said manual, yield at least an equal amount, making a sum total of nearly $60,000,000.00 as the value of one only of the many patents used by the railroads of this country according to the rule of damages adopted in this case, leaving out of the account the far greater number of freight-cars running on said roads, on many of which the double-acting brake is also employed.

Fourth. And your petitioner further show unto your honors that heretofore, to wit, on the sixth day of December, A. D. 1855, the said Henry Tanner, who was then the owner of the said patent for the State of Illinois and elsewhere, for a valuable consideration to him paid by the Chicago, S't Paul and Fond du Lac R'road Co., conveyed to said company the exclusive right to use said improvement on its own cars on the seventy miles of road within said State of Illinois; that
106 afterwards your petitioners became possessed of said road and of
all the rights and franchises belonging to said Chicago, S't Paul and Fond du Lac Railroad Company, including, as your petitioners insist, the said exclusive right to use said improvement on its own cars on said 70 miles, and especially such and so many of said brakes as were made and used by said Chicago, S't Paul and Fond du Lac R. R. Co., and afterwards came into the possession of your petitioner under the mesne conveyances herewith produced, as shown in the affidavits filed herewith, all of which will appear more fully from the writings herewith offered for the inspection of the court, and none of which were produced on any of the former hearings of this cause or were ever made a part of the evidence herein.

Fifth. And your petitioners further show unto your honors that they have been charged in said report and final decree with twenty brakemen saved on the said 28 or 29 cars run by them during the said five years on the assumption that they used or would have used so many additional brakemen on said cars during that time; whereas your petitioners say and are prepared to prove that they never did use and never would have used that number, or if they had so used them said brakemen would have been employed a considerable part of the time in other duties on said road, and thus a very considerable part of the expense would have been saved to your petitioners.

107 Sixth. And your petitioners further show unto your honors
that the said Henry Tanner, so being owner of the said patent-right as above stated, made two other sales, licenses, or assignments of a similar character to that above named, one dated   , to the   , and one dated   , and that afterwards, to wit, on the   day of   , the said Thomas Sayles, to whom said patent has been conveyed, made a similar conveyance to the   , as by copies of said three several conveyances hereto annexed to the affidavit of Albert Keep will more fully and at large appear.

And your petitioner claims that by the making and giving of said several instruments the said Tanner and the said Sayles have fixed and established a license-fee as the value of said patent, and that that therefore should determine the amount to be awarded to complainant instead of the profits accrued to defendants, as is well settled by the rule of law laid down in such cases.

All of which matters appear from the affidavit filed herewith.

And your petitioners therefore pray that for the reasons above stated, or some of them, said decree may be opened, and that they may be allowed to introduce such new evidence into the cause as may be necessary to establish the facts above set forth, and such other facts 108 as may be pertinent thereto, and that the cause may be again heard by the court on all the evidence then in the case, and may be again referred to the master to take and state an account, if the court shall be of the opinion that the plaintiff is entitled thereto under the order and direction of the court, and that your petitioners may have leave to file a supplemental bill or a supplemental bill in the nature of a bill of review, if such shall be deemed necessary to the court in order to give them the relief herein prayed: And that your petitioners may have such further, or other, or different relief as the nature of this case may require and as to your honors shall seem meet.

THE CHICAGO & NORTHWESTERN R'Y CO.,
By ALBERT KEEP, *President.*

GEORGE PAYSON,
Solicitor of Petitioner & of Counsel.

(Endorsed:) Filed Feb'y 20, 1874. W'm H. Bradley, cl'k.

109 *Affidavit of Albert Keep.*

STATE OF ILLINOIS,
Cook County, ss:

United States circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.
} In chancery.

Albert Keep, being duly sworn, deposes and says that he is president of the said Chicago and Northwestern Railroad Company; that according to the best information on the subject he can obtain, viz, calculations drawn from "Manual of Railroads of the United States for 1873–'4," compiled by H. V. Poor, a printed publication well known to and 110 in general use by railroad companies, the average number of passenger-cars running on all the railroads in the United States during the fourteen years ending in July, 1866, was about 4,500, and that the average number for the seven years following was about 9,000, and that the average number of freight-cars running on said road during said period of 21 years was fully twenty times as great as the number of passenger-cars.

That according to the above estimate, $450 for each passenger-car per year would amount to over fifty-six millions of dollars for the said period of twenty-one years covered by the said Tanner patent, so called, and the extension thereof, and that, as this affiant is informed and believes, this is less than the amount arrived at by the said complainant, based on a somewhat similar calculation.

That the above sum does not include any of the freight-cars used on said railroads, though, as this affiant is informed and believes, double-acting brakes have also been used on a large number of said freight-cars, but just how many this affiant is unable to state.

And this affiant further states that the said double-acting brake is but one out of many hundreds or even thousands of devices used by the railroads of this country, a large number of which are patented; and that if said roads should be called upon to pay for all said patented
111 devices at the same rate that said defendant is by said final decree called upon to pay for said brake, or even half that rate, it would, in the opinion of this affiant, carefully and deliberately formed, bankrupt every railroad in the United States.

And this affiant further saith, that even admitting that said sum of $63,638.40 has been saved by the use of said brake during the period covered by said decree, which, however, this affiant expressly denies; still, no one having any skill, knowledge, or experience in the management of railroads could ever suppose that that amount, or half thereof, had been saved by defendant, or that defendant was so much richer, or had made that amount of profits by the use of said brake, or that all the railroads in the country have saved sixty millions thereby. But the fact is, as is well known to any one acquainted with the subject, that no railroad company ever has or ever can put into its own pocket the amount saved by any improvement, patented or not, but is obliged, and in fact driven and compelled, constantly to reduce its rates, and thus to share with the public the benefits and advantages of every such invention or improvement; and that whereas the value of money has diminished fully one-half during the past 20 years, and the price of nearly every other commodity has increased in the same proportion, the railroads of this country are carrying passengers and freight at about
112 the same rates in dollars and cents—that is, at about half the real rates received by them 20 years ago.

And this affiant further saith that said Chicago and Northwestern Railway Company now has in its possession, besides the license or conveyance to the Chicago, S't Paul & Fond du Lac Railroad Co., three other instruments of a similar character, two made by said Henry Tanner and one by said Thomas Sayles, copies of which are hereto annexed, and marked "Exhibits A B & C D."

And this affiant further saith that he has been informed and believes that still other instruments of the same or a similar character have been made by the said Tanner or the said Sayles to various other roads; and that said defendant would be able fully and conclusively to prove the same to the entire satisfaction of this court, if any opportunity should be offered so to do.

ALBERT KEEP.

Subscribed and sworn to before me this 20th day of February, 1874.

[SEAL.] J. B. REDFIELD,
Notary Public.

(Endorsed:) Filed Feb'y 20, 1874. W'm H. Bradley, cl'k.

113 TANNER'S PATENT RAILROAD-BRAKE.

Whereas I, Henry Tanner, of the city of Buffalo, county of Erie, and State of New York, as the assignee of L. F. Thompson, of Charlestown,

and A. G. Bachelder, of Lowell, Mass., did obtain letters patent
114 of the United States for a new method of applying and using
railroad-brakes, which letters patent were applied for by said
Thompson & Bachelder in June, A. D. 1847, but issued to me July 6th, 1852, giving and granting to me, the said Henry Tanner, my heirs, administrators, and assigns, the full and exclusive liberty of making, using, and vending to others to use, the said improvement during the term of 14 years:

Now, therefore, know all men by these presents that I, the said Henry Tanner, for the consideration of twelve hundred and thirty-five dollars, by me received to my full satisfaction from the Galena and Chicago Union Railroad Company, have licensed and conveyed, and by these presents do license and convey unto the said Galena and Chicago Union Railroad Company the full and exclusive right and liberty of using the said improvement on any or all of their own cars, over any part or on all of their said railroads which is represented by their charter, or their branches, or upon roads having purchased like rights, and not elsewhere, to have and to hold and enjoy all and every privilege, benefit, and emolument which may in any wise arise from said improvement within the limits above mentioned during the term of these letters patent, or of any extension of the same.

This deed is for two hundred & forty-seven miles of road, and is in full for all past use of said brake.

In witness whereof I have hereunto set my hand and seal this
115 fourth day of December, A. D. 1855.
(Signed) HENRY TANNER. [L. S.]

In presence of—
(Signed) P. A. HALL.

STATE OF ILLINOIS,
County of Kane, ss:

Joseph B. Redfield, being duly sworn, says that he has compared the foregoing with an original paper executed by Henry Tanner, and that the same is a true copy of said original now in his custody, and of the whole thereof.

J. B. REDFIELD.

Subscribed and sworn to before me this 30th day of January, A. D. 1874.

[SEAL.] DAN'L D. BATHRICK,
Notary Public.

TANNER'S PATENT RAILROAD-BRAKE.

Whereas I, Henry Tanner, of the city of Buffalo, county of Erie, and State of New York, as the assignee of L. F. Thompson, of Charlestown, and A. G. Bachelder, of Lowell, Mass., did obtain letters patent of the United States for a new method of applying and using railroad-brakes, which letters patent were applied for by said Thompson & Bachelder in June, A. D. 1847, but issued to me July 6th, 1852, giving and granting
to me, the said Henry Tanner, my heirs, administrators, and
116 assigns, the full and exclusive liberty of making, using, and vending to others to use, the said improvement during the term of 14
years:

Now, therefore, know all men by these presents that I, the said Henry

Tanner, for the consideration of one hundred and sixty-one dollars by me received to my full satisfaction from the Chicago and Milwaukee Railroad Company, have licensed and conveyed, and by these presents do license and convey unto the said Chicago and Milwaukee Railroad Company laying within the State of Illinois, and being for forty-five miles, the full and exclusive right and liberty of using the said improvement on any or all of their own cars over any part or on all of their said railroad, which is represented by their charter within said State of Illinois, and being forty-five miles, or their branches or upon roads having purchased like rights, and not elsewhere. To have and to hold and enjoy all and every privilege, benefit, and emolument which may in anywise arise from said improvement, within the limits above mentioned during the term of these letters patent or of any extension of the same. This being also in full for past use in the above limits, and any increase within the said State above 45 miles may be paid at the same rate while I may own the State right for the patent.

In witness whereof I have hereunto set my hand and seal this sixth day of December, A. D. 1855.

(Signed) HENRY TANNER. [L. S.]

117 In presence of—
(Signed) H. W. BLODGETT.

STATE OF ILLINOIS,
County of Kane, ss:

Joseph B. Redfield, being duly sworn, says that he has compared the foregoing with an original paper executed by Henry Tanner, and that the same is a true copy of said original now in his custody, and of the whole thereof.

J. B. REDFIELD.

Subscribed and sworn to before me this 30th day of January, A. D. 1874.

[SEAL.] DAN'L D. BATHRICK,
Notary Public.

TANNER'S PATENT RAILROAD-BRAKE.

Whereas Henry Tanner, of the city of Buffalo, county of Erie, and State of New York, as the assignee of L. F. Thompson, of Charlestown, and A. G. Bachelder, of Lowell, Mass., did obtain letters patent of the United States for a new method of applying and using railroad-brakes, which letters patent were applied for by said Thompson & Bachelder in June, A. D. 1847, but issued to said Tanner, July 6th, 1852, giving and granting to the said Henry Tanner, his heirs, administrators, and assigns the full and exclusive liberty of making, using, and vending to
118 others to use the said improvement during the term of 14 years;
and whereas by deed bearing date July 13th, 1854, said Tanner conveyed to Thomas Sayles, of Lansingburgh, all his right, title, interest, and claim whatsoever in said invention.

Now, therefore, know all men by these presents that I, the said Thomas Sayles, for the consideration of four hundred dollars by me received to my full satisfaction from the Green Bay, Milwaukee & Chicago Railroad Company have licensed and conveyed, and by these presents do license and convey unto the said Green Bay, Milwaukee and Chicago Railroad Company the full and exclusive right and liberty of using the said improvement on any or all of their own cars, over any part or on all of their said railroad, which is represented by their charter from Milwaukee to Illinois State line, forty miles, or upon roads having purchased like rights, and not elsewhere. To have and to hold and enjoy all and every privilege, benefit, and emolument, which may in anywise arise from said improvement within the limits above-mentioned during the term of these letters patent, or of any extension of the same.

In witness whereof I have hereunto set my hand and seal this twenty-second day of July, A. D. 1856.

(Signed) THO'S SAYLES.

In presence of—
(Signed) C. B HALL.
(Signed) A. V. H. CARPENTER.

119 STATE OF ILLINOIS,
County of Kane, ss:

Joseph B. Redfield, being duly sworn, says that he has compared the foregoing with an original paper executed by Tho's Sayles, and that the same is a true copy of said original now in his custody, and of the whole thereof.

J. B. REDFIELD.

Subscribed and sworn to before me this 30th day of January, A. D. 1874.

[SEAL.] DAN'L D. BATHRICK,
Notary Public.

(Endorsed:) Filed Feb'y 20, A. D. 1874. W'm H. Bradley, cl'k.

120 Afterwards, to wit, on the 17th day of March, A. D. 1874, in the record of the proceedings of said court in said entitled cause before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } Chancery.

Now come the parties, by their solicitors, and now comes on to be heard the motion of defendant to vacate the decree herein, and for leave to file additional proof herein, and after hearing the same in part the further hearing of the same is postponed until to-morrow morning.

121 Afterwards, to wit, on the 18th day of March, A. D. 1874, in the record of the proceedings of said court in said entitled cause before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAL SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } Chancery.

Now come again the parties, by their solicitors, and now comes on to be further heard the motion of defendant to vacate the decree, and to file additional proof herein, and after hearing the same the court, not being now sufficiently advised in the premises, takes time to consider.

Tanner, for the consideration of one hundred and sixty-one dollars by me received to my full satisfaction from the Chicago and Milwaukee Railroad Company, have licensed and conveyed, and by these presents do license and convey unto the said Chicago and Milwaukee Railroad Company laying within the State of Illinois, and being for forty-five miles, the full and exclusive right and liberty of using the said improvement on any or all of their own cars over any part or on all of their said railroad, which is represented by their charter within said State of Illinois, and being forty-five miles, or their branches or upon roads having purchased like rights, and not elsewhere. To have and to hold and enjoy all and every privilege, benefit, and emolument which may in anywise arise from said improvement, within the limits above mentioned during the term of these letters patent or of any extension of the same. This being also in full for past use in the above limits, and any increase within the said State above 45 miles may be paid at the same rate while I may own the State right for the patent.

In witness whereof I have hereunto set my hand and seal this sixth day of December, A. D. 1855.

(Signed) HENRY TANNER. [L. S.]

117 In presence of—
(Signed) H. W. BLODGETT.

STATE OF ILLINOIS,
County of Kane, ss:

Joseph B. Redfield, being duly sworn, says that he has compared the foregoing with an original paper executed by Henry Tanner, and that the same is a true copy of said original now in his custody, and of the whole thereof.

J. B. REDFIELD.

Subscribed and sworn to before me this 30th day of January, A. D. 1874.

[SEAL.] DAN'L D. BATHRICK,
Notary Public.

TANNER'S PATENT RAILROAD-BRAKE.

Whereas Henry Tanner, of the city of Buffalo, county of Erie, and State of New York, as the assignee of L. F. Thompson, of Charlestown, and A. G. Bachelder, of Lowell, Mass., did obtain letters patent of the United States for a new method of applying and using railroad-brakes, which letters patent were applied for by said Thompson & Bachelder in June, A. D. 1847, but issued to said Tanner, July 6th, 1852, giving and granting to the said Henry Tanner, his heirs, administrators, and assigns the full and exclusive liberty of making, using, and vending to
118 others to use the said improvement during the term of 14 years;
and whereas by deed bearing date July 13th, 1854, said Tanner conveyed to Thomas Sayles, of Lansingburgh, all his right, title, interest, and claim whatsoever in said invention.

Now, therefore, know all men by these presents that I, the said Thomas Sayles, for the consideration of four hundred dollars by me received to my full satisfaction from the Green Bay, Milwaukee & Chicago Railroad Company have licensed and conveyed, and by these presents do license and convey unto the said Green Bay, Milwaukee and Chicago Railroad Company the full and exclusive right and liberty of using the said improvement on any or all of their own cars, over any part or on all of their said railroad, which is represented by their charter from Milwaukee to Illinois State line, forty miles, or upon roads having purchased like rights, and not elsewhere. To have and to hold and enjoy all and every privilege, benefit, and emolument, which may in anywise arise from said improvement within the limits above-mentioned during the term of these letters patent, or of any extension of the same.

In witness whereof I have hereunto set my hand and seal this twenty-second day of July, A. D. 1856.

(Signed) THO'S SAYLES.

In presence of—
(Signed) C. B HALL.
(Signed) A. V. H. CARPENTER.

119 STATE OF ILLINOIS,
County of Kane, ss:

Joseph B. Redfield, being duly sworn, says that he has compared the foregoing with an original paper executed by Tho's Sayles, and that the same is a true copy of said original now in his custody, and of the whole thereof.

J. B. REDFIELD.

Subscribed and sworn to before me this 30th day of January, A. D. 1874.

[SEAL.] DAN'L D. BATHRICK,
Notary Public.

(Endorsed:) Filed Feb'y 20, A. D. 1874. W'm H. Bradley, cl'k.

120 Afterwards, to wit, on the 17th day of March, A. D. 1874, in the record of the proceedings of said court in said entitled cause before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company.
} Chancery.

Now come the parties, by their solicitors, and now comes on to be heard the motion of defendant to vacate the decree herein, and for leave to file additional proof herein, and after hearing the same in part the further hearing of the same is postponed until to-morrow morning.

121 Afterwards, to wit, on the 18th day of March, A. D. 1874, in the record of the proceedings of said court in said entitled cause before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAL SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company.
} Chancery.

Now come again the parties, by their solicitors, and now comes on to be further heard the motion of defendant to vacate the decree, and to file additional proof herein, and after hearing the same the court, not being now sufficiently advised in the premises, takes time to consider.

122 Afterwards, to wit, on the 12th day of October, A. D. 1874, in the record of the proceedings of said court in said entitled cause before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

By agreement of parties, leave is given defendant to file answer herein as of the day of , A. D. .

123 Afterwards, to wit, on the 18th day of September, A. D. 1875, in the record of the proceedings of said court in said entitled cause before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company. } In chancery.

A motion having been heretofore made in this case, and leave given on the twentieth of February, eighteen hundred seventy-four by the court to file a petition to set aside the decree of this court made on the twenty-second of December, eighteen hundred seventy-three, and for other purposes, and the same having been argued in court, and afterwards by printed arguments furnished by the counsel of the respective parties, and the court being now sufficiently advised, sustains said motion as to the amount of said decree only, and hereby opens the said decree for the purpose of modifying the same as to the amount of gains, profits, savings, benefits, and advantages accruing to the defendant in consequence of the infringement of the letters patent mentioned in said decree, and instead of the sum of sixty-three thousand six hundred and thirty-eight dollars and forty cents ($63,638.40), it is hereby adjudged and decreed that the complainant do recover of the defendant as of this date for the gains, profits, savings, benefits, and advantages accru-
124 ing to, and realized from the infringement of the said letters patent and the use of the said invention the sum of forty-seven thousand seven hundred and twenty-five dollars.

And it is further ordered that in all other respects the aforesaid decree stand in full force and effect.

And thereupon the defendant prays an appeal to the supreme court which is allowed by the court on bond being given according to law.

125 Afterwards, to wit, on the 25th day of October, A. D. 1875, said defendant by its solicitor filed in said clerk's office, its petition with affidavit in support thereof in said entitled cause, which said petition and affidavit are in the words and figures following, to wit:

UNITED STATES OF AMERICA,
Northern District of Illinois, ss:

United States circuit court.

THOMAS SAYLES *v.* THE CHICAGO & NORTHWESTERN RAILWAY COMPANY.	In chancery.

To the honorable Thomas Drummond, judge of said court in chancery, sitting:

The petition of the Chicago & Northwestern Railway Company, defendant in the above-entitled suit, shows unto your honor that heretofore, to wit, on or about the eighth day of October, A. D. 1871, the records of the above cause then pending in this court, including the evidence and pleadings in said cause were destroyed by the great fire, which occurred at that date, in the city of Chicago, in said district. That there was on file at that time, among the records pertaining to said cause, an amended answer theretofore filed by said defendant in said cause setting up certain new defences to said suit, viz, what is known as the
Stanley Tallson matter, and the Tyler car matter; that said loss
126 or destruction occurred without the fault or neglect of your petitioner in any way or shape; that a certified copy of said amended answer cannot be obtained by your petitioner; that the loss or destruction thereof, unless supplied, will or may result in damage to your petitioner by depriving your petitioner of one of the defences set up by your petitioner in said suit, either in whole or in part; that a substantial copy of said amended answer so destroyed is hereto annexed.

Your petitioner, therefore, prays that said copy may be ordered by this court to be entered of record in said cause, and that the same may be substituted in the said cause in place of said original amended answer, so lost or destroyed as aforesaid.

THE CHICAGO & NORTHWESTERN RAILWAY COMPANY,
By GEORGE PAYSON,
Its Solicitor.

GEORGE PAYSON,
Defendant's Solicitor & of Counsel.

UNITED STATES OF AMERICA,
Northern District of Illinois, ss:

In the United States circuit court for said district.

THOMAS SAYLES *v.* THE CHICAGO & NORTHWESTERN RAILWAY Company.	In chancery.

Henry W. Blodgett, being duly sworn, says that he was for-
127 merly the solicitor of the defendant in the above-entitled cause; that he has read the foregoing petition, and that the allegations therein contained are true; that he did, as such solicitor of said defendant, cause an amended answer to be prepared and filed in said cause, by leave of court first had and obtained, for the purpose of setting up the defence mentioned in the above petition; that he has heard read the annexed answer, and that the same is in substance a copy of the said amended answer so prepared and filed by him in the said cause as aforesaid.

And this affiant further saith, that on the argument of said cause the evidence of the witnesses named in said amended answer was very fully and minutely commented upon by the counsel for both parties and by the court, and without a word of objection being made by any one on account of the supposed want of such amended answer; nor has this affiant ever heard a doubt expressed as to the fact of filing said answer, until since the application made to the court for leave to restore it. That this affiant has no doubt whatever in regard to tne preparing and filing of said amended answer as aforesaid.

H. W. BLODGETT.

Sworn to & subscribed before me this 25th day of October, A. D. 1875.

E. A. DRUMMOND, *U. S. Com.*

128 (Endorsed:) Filed Oct. 25th, 1875. W'm H. Bradley, cl'k.

And on the same day, to wit, the 25th day of October, A. D. 1875, in the record of the proceedings of said court in said-entitled cause, before the Hon. Thomas Drummond, judge, is the following entry, to wit:

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

On application of the plaintiff the court allows the following papers to be supplied as having been in the pleadings and before the court at the hearing: the replication and the various assignments referred to in the evidence taken before Moulton, master, on March twelfth, 1862, and the letters patent. And on application of the defendant to file a copy of an amended answer, the court allows the same; inasmuch as if the same is not an exact copy of the original amended answer filed, the court certifies that the testimony of all the witnesses therein named was used and read on the hearing by the defendant without objection on the part of the plaintiff, and the same was treated as before the
court by the counsel on both sides, and was considered by the
129 court, all the above papers having been destroyed by the fire of
October ninth, A. D. 1871.

And on the same day, to wit, the 25th day of October, A. D. 1875, said defendant, by its solicitor, filed in said clerk's office its amended answer in said-entitled cause, which said answer is in the words and figures following, to wit:

Amended answer.

United States circuit court, northern district of Illinois.

THOMAS SAYLES
v.
THE CHICAGO & NORTHWESTERN RAILWAY Company. } In chancery.

The amended answer of the said Chicago & Northwestern Railway Company, defendant, to the bill of complaint of Thomas Sayles, complainant.

This defendant, by way of amended answer in this case, by leave of court first had and obtained, further answering, says:

That it denies that said Batchelder and Thompson were the first and

original inventors of the said pretended improvement described in the said letters patent issued to said Henry Tanner, but alleges, on information and belief, that the same had been, prior to the said pretended invention thereof by said Batchelder & Thompson, used on the Camden & Amboy Railroad, in the State of New Jersey, and that said use 130 was known to Edwin Lockwood, George W. Thompson, Nicholl F. Smith, William Venable, Benjamin L. Wolcott, George Stockham, Thomas W. Dunn, Joseph Reed, and Robert C. Buzby, residing at Bordentown; and to Letchworth Cox, residing at Jamesburgh; and Charles Gundt, William Crim, Thomas Hubert, Asher Pancoast, and Andrew Heath, residing at Camden; to Richard C. Wolcott, residing at Hoboken; to John H. Jobes and William Coulter, residing in Jersey City; to Jonas Hagar, residing at New Brunswick; to John H. Hillman, James Seeds, and James C. Hillman, residing at Trenton; to Joseph Cassner, Henry H. Disbrow, William Disbrow, and Patrick Bogg, residing at South Amboy; to James S. Gamble, residing at Newark; to Joseph F. Tallson, residing at Hudson City; all in the State of New Jersey; to John Conover, residing in Philadelphia, Penn.; and Joseph Head, of Bristol, Penn.; and to Isaac Dripps, residing at Fort Wayne, Indiana. And had been so used on the road of the New Jersey Railroad and Transportation Company, in New Jersey, and said use was known to said Joseph F. Tallson, John H. Jobes, and James T. Gamble; to Bernard Hughes, of Jersey City, Alfred Hurd, of New Brunswick, all in said State of New Jersey, and that said letters patent were, therefore, null and void, and prays to be hence dismissed, &c.

131 THE CHICAGO NORTHWESTERN RAILWAY COMPANY,
By H. W. BLODGETT,
Def't's Solicitor and of Counsel.

(Endorsed:) Filed Oct. 25th, 1875. W'm H. Bradley, cl'k.

132 And afterwards, to wit, on the 26th day of October, A. D. 1875, said complainant, by his solicitors, filed in said clerk's office his replication to said amended answer in said-entitled cause, which said replication is in the words and figures following, to wit:

Replication to amended answer.

United States circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.

The replication of Thomas Sayles, complainant, to the amended answer of The Chicago and Northwestern Railway Company, defendant.

This replicant, saving and reserving unto himself now and at all times hereafter all and all manner of benefit and advantage of exception which may be had or taken to the manifold insufficiencies of the said answer, for replication thereunto says, that he will aver, maintain, and prove his said bill of complaint to be true, certain, and sufficient in law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by this replicant; without this, that any other matter or thing whatsoever in said answer contained material or effectual in the law to be replied unto, and

133 not herein and hereby well and sufficiently replied unto, confessed and avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver, maintain, and prove, as this honorable court shall direct, and humbly prays as in and by his said bill he has already prayed.

WEST & BOND,
Complainant's Solicitors.

(Endorsed:) Filed Oct. 26, A. D. 1875. W'm H. Bradley, cl'k.

134 *Replication.*

Replication, filed by leave of court.

United States circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.

The replication of Thomas Sayles, complainant, to the answer of the Chicago and Northwestern Railway Company, defendant.

This repliant, saving and reserving unto himself now and at all times hereafter all and all manner of benefit and advantage of exception which may be had or taken to the manifold insufficiencies of the said answer, for replication thereunto says that he will aver, maintain, and prove his said bill of complaint to be true, certain, and sufficient in law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by this repliant, without this, that any other matter or thing whatsoever in said answer contained material or effectual in the law to be replied unto, and not herein and hereby well and sufficiently replied unto, confessed and avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver, maintain, and prove, as this honorable court shall direct; and humbly prays as in and by his said bill he has already prayed.

135 GOODWIN, LARNED & GOODWIN,
Complainant's Solicitors.

136 Afterwards, to wit, on the 7th day of October, A. D. 1874, said parties, by their solicitors, filed in said clerk's office their stipulation in said entitled cause; which said stipulation is in the words and figures following, to wit:

Stipulation as to record to Supreme Court.

United States circuit court, northern district of Illinois, seventh circuit.

THOMAS SAYLES
vs.
CHICAGO AND NORTHWESTERN RAILWAY Company.
} Chancery.

Stipulation as to record to Supreme Court.

It is hereby stipulated and agreed, by and between the parties to the above-entitled cause, that all letters patent, models, reports, and exhibits produced and used in the circuit court and before the master in this cause may be produced, referred to, and used on the hearing in the Supreme Court with the same privilege and effect as if each and all of them were made a part of the record in this case.

GEORGE PAYSON,
Of Counsel for Defendant.
WEST & BOND,
Sol'rs for Comp't.

Done at Chicago, Illinois, this seventh day of October, A. D. 1874.

(Endorsed:) Filed October 7, 1874. W'm H. Bradley, cl'k.

137 Afterwards, to wit, on the 21st day of October, A. D. 1873, said parties, by their solicitors, filed in said clerk's office their stipulation in said entitled cause; which said stipulation is in the words and figures following, to wit:

Stipulation as to proofs.

In the circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILROAD Company.

It is hereby stipulated and agreed by and between the parties to the above-entitled cause, by their solicitors, respectively, that the printed book accompanying this stipulation and marked "Exhibit A" contains all the proofs taken on the part of said complainant upon the accounting before the master under the orders of reference heretofore entered in said cause, together with all the proofs taken on the part of said defendant upon said accounting prior to July 31st, 1872; and that the printed book also accompanying this stipulation and marked "Exhibit B" contains all the proofs taken on the part of said defendant upon said accounting on and subsequent to said July 31st, 1872, and that said proofs and the models and exhibits referred to therein were submitted to said master.

And it is further stipulated that said Exhibits A & B may be 138 filed in said cause as and for the proofs taken and submitted to said master upon said accounting, and when so filed shall be regarded in all respects as the original proofs taken before said master, and may be referred to and treated as though they were said original proofs returned into court by said master and referred to and identified in his report.

Chicago, August 22d, 1873.

WEST & BOND,
Sol'c't's for Comp't.
JOHN N. JEWETT,
Solct. for Def't.

(Endorsed:) Filed Oct. 21, 1873. W'm H. Bradley, cl'k.

139 *Certificate of evidence.*

140 United States circuit court, northern dist. of Illinois.

THOMAS SAYLES
vs.
CHICAGO & NORTHWESTERN RAILWAY COMPANY. } In chancery.

Certificate of evidence for record to supreme court.

1. The testimony of the following-named witnesses taken on the part of the complainant before the first hearing, viz: Lester L. Bond, Ephraim Harris, Albert J. Bellows, Albert Fisher, Asahel G. Batchelder, Samuel Cooper, James M. Stebard, John Stockbridge, s'r, T. Douglas, Samuel Blatchford, A. Emigh, Gorham P. Fields.

2. The testimony of the following-named witnesses, taken on the part of the defendant before the first hearing, viz: John Mulligan, Henry H. Snow, Emery Stubbins, Wilson Eddy, Ferdinand Leppens, Sarah A. Allen (with exhibits), James M. Hebard, James Milholland, John C. A. Smith, William Leahy, James Francis, John J. Elder, Isaac Denmead, George Woods, Robert S. Hollins, John Yakel.

3. Letters patent numbered 9109, granted 6th of July, 1852, to Henry Tanner, with the schedules accompanying the same.

4. The clerk's minutes and certificates in the cases of Henry
141 Tanner vs. The New York and Erie Railroad Company, tried in
October, 1854; of Nehemiah Hodge vs. The New York Central
Railroad Company, tried in 1859; and of Henry Tanner vs. The Hudson
River Railroad Company in 1853.

5. The testimony of the following-named witnesses entitled "Complainant's new proofs" for final hearing:

James E. Hutton.
Edgar Morris.
George Brown.
David H. Baker.
Silas H. Brown.
David T. Jeffries.
Erastus Reid.
Ambrose Ward.
Jordan Fernald.
Thomas O'Mahoney.
Abraham C. Condit.
John Leach.
Edward T. Moore.
John T. Areson.
John D. Chapman.
William Frederickson.
J. T. Areson, recalled.

Patrick Mitchell.
J. D. Chapman, recalled.
Thomas Sales.
Henry Waterman.
James McFarland.
Sam'l Blatchford.
W'm Quigley.
Charles M. Keller.
Thomas Sayles, recalled.
Tho's M. North.
Miles G. Moies.
Ryniear Van Syckel.
Aaron H. Palmer.
Francis A. Stevens.
Jeremiah Counsellor.

Isaac W. Van Houten.
Isaac Nostrand.
John Briggs, junior.
Henry Tanner.
W'm W. Hubbell.
Cha's H. Frisbie.
Patrick H. Flannegan.
Cha's Yandt,
Benj. T. Seward.
Joseph Herbert.
Joseph Capner.
George W. Teefe.
T. M. North, recalled.
Henry H. Disbrow.
G. W. Teefer, recalled.
Geo. Gifford, recalled.
Isaac P. Wendell.

142 Richard C. Wolcott.
D. H. Baker, recalled.
H. Waterman, recalled.
Tho's Sayles, recalled.
W'm Crimm.
Asher Pancoast.
George Gifford.

James Leeds.
Tho's P. Grosvenor.
D. H. Baker, recalled.
W'm Coulter.
Stephen W. Reilly.
I. P. Wendell, recalled.
Tho's Sayles, recalled.

Asher Pancoast, recalled.
Elizabeth Pancoast.
J. Herbert, recalled.
C. Yandt.
I. P. Wendell, recalled.
Mark C. Hubbard.

6. The testimony of the following-named witnesses for the defendant and entitled "Defendant's new proofs for the final hearing":

Edwin Lockwood.
George W. Thompson.
Nichol F. Smith.
Letchworth Cox.
W'm Venable.
Cha's Yandt.
W'm Crimm.
Richard C. Wolcott.
John H. Jobes.
Tho's Herbert.
B. L. Wolcott.
Geo. Stockham.
Tho's W. Dunn.
John Conover.
143 Smith Ryder.
Joseph Head.
Joseph Reid.
Jonas Hagar.
W'm Coulter.
John H. Hillman.
James Seeds.
Joseph Capner.
Ja's C. Hillman.
Asher Pancoast.
Henry D. Disbrow.
Cha's Cox.
W'm Disbrow.
Patrick Begy.
J. F. Talson.
Andrew Heath.
Rob't Buzby.
Rob't S. Van Rensselaer.
Uriah Van Vorhees.
Joseph Farrell.
Josiah Phillips.
N. H. Marshall.
Fred Boies.
John H. Jobes, recalled.
George Osman.
Ja's S. Gamble.
Bernard Hughes.
Geo. W. Fielden.

7. Testimony of the following witnesses entitled "Defendant's additional proofs":

James E. Hutton.
Edward T. Moore.
Emory Stebbins.
W. Coulter, recalled.
Alfred Hurd.
J. E. Cudlipp.
J. W. Bampton.
R. C. Burgby.
Nichol F. Smith, recalled.
Isaac Dripps.
E. Lockwood, recalled.

8. The testimony of the following witnesses taken before the master on the accounting—on the part of the complainant:

Ashel Emigh.
C. C. Kellogg.
Henry Tanner.
Henry Morris.
W. T. Ragland.
W'm Gunther.
Samuel Thomas.
J. P. Van Doren.
Geo. W. Brown.
John B. Hill.
Humphrey Jackman.
P. S. Devlan.
L. F. Tronson.
S. L. Moore.
144 James M. Cotting.
J. P. Van Doren, rec.
H. Jackman, "
L. F. Tronson, "
Allen Ostrander.
H. T. Douglas.
F. Nevins.
C. H. Frisbie.
P. S. Devlan, recalled.
C. W. Burton.
Ja's E. Hulton.
John P. Ray.
H. B. Milliken.
L. F. Tronson, recalled.
P. M. De Camp.
Horatio Anderson.
Louis Elder.
J. B. Wilson.
H. Jackman, recalled.
Edwin Jones.
W. Riddell.
J. P. Martin.
Albert Bridges.
J. P. Martin, recalled.
E. S. Renwick.
W. H. Marlue.
Frank Suiger.
John A. Sharp.
O. H. Lee.
John Ebbert.

9. Rebutting testimony of the following witnesses on the part of complainant:

O. L. Smith.
P. M. Peckham.
C. H. Smith.
G. L. Gates.
Leslie Crocker.
M. L. Brayman.
A. G. Batchelder, rec.
B. F. George.
J. McAllister.
J. P. Searle.
E. Upson.
L. F. Crane.
R. W. Bibber.
W'm O'Brien.
Hervey Waters.
Edward Laing.
E. L. Wallace.
G. W. Brown, rec.

Richard Lynch.
E. A. Thomas.
O. A. Lockwood.
O. L. Smith, recalled.
W. D. Hilton.
M. L. Brayman, rec.
P. M. Peckham, rec.
W'm Capron.
S. S. Mowry.
O. A. Brigham.
A. G. Batchelder.
W. R. Batchelder.
Cha's Flagg.
W. R. Batchelder, rec.

Ed. Reynolds.
J. D. Sherwood.
J. T. Daid.
G. Churchill.
A. G. Sherman.
John Moran.
E. A. Wood.
L. Harding.
H. W. Fenner.
J. P. Pierce.
C. G. Parker.
J. G. Witherbee.
R. Boyden.
G. H. Gardner.

S. Thomas, “
C. Watts.
D. H. Baker.
S. B. Stull.
H. H. Farnum.
W. H. Weightman.
A. P. Doane.
W. Homan.
Adam Craft.
A. P. Doane, recalled.
John Charts.
I. L. Wadleigh.
A. Bridges.
W. H. Weightman, rec.

145 W. Geddes.
A. G. Fuller.
S. P. Rand.
H. Blessing.
E. S. Renwick, rec.
C. Van Demark.
J. P. Van Doren, recalled.

A. Parmer.
E. F. Hall.
Jerry Peron.
S. B. Cushing.
L. E. Rood.
E. Stebbins, corrections.
E. Lang, “
W. R. Hutchins.

John Coppithorne.
O. L. Smith, recalled.
H. Waters, recalled.
E. Lang, “
T. J. Hillock.
B. F. George, rec.
Tho's Sayles, rec.

10. Stipulations of March 20th, 1867, and May 10th, 1873.

11. Testimony of the following witnesses for the defendant on the final accounting.

N. W. Huntley.
Tho's Hull.
S. J. Hayes.
B. Garvin.
G. L. Dunlap.
W. H. Russell.
F. D. Adams.
E. S. Dudley.
J. W. Clark.
Ben Ray.
J. A. Smith.
L. D. Hodgkins.

J. Mulligan.
H. H. Show.
Wilson Eddy.
E. Stebbins.
J. Lightner.
G. F. Lincoln.
L. A. Shorts.
J. Brown.
C. Teeling.
R. C. Steele.
W. Jennings.
J. B. Adams.

C. W. Marsh.
W. W. Stevens.
J. Bartlett.
H. F. Taylor.
C. Harridon.
James Lyon.
T. Chase.
S. B. Cushing.
H. Waterman.
W. O'Brien.
G. H. Gardner.
W. O'Brien, recalled.

146 H. M. Rogers.
B. C. Read.
J. C. Blood.
A. Wing.
J. D. Emmerson.
R. Hitchcock.
W. H. Stearns.
J. B. Clancy.
H. A. Wright.

U. F. Sampson.
B. D. Perry.
H. Wolf.
J. Peron.
H. Waterman, recalled.
B. C. Reed, “
E. Lang, “
B. Ray, “
J. A. Clark.

E. Stebbins, recalled.
B. W. Hobart.
W. Carrigan.
W. McCormick.
O. L. Smith.
S. L. T. Dergo.
J. A. Hearn.
A. Berney.

12. The stipulation concerning letters patent, models, exhibits, and reports filed Oct. 7th, 1874. Stipulation concerning the proofs taken on the accounting taken before the master, filed Oct. 21st, 1873.

13. The Patent Office files in the application of Batchelder and Thompson, excepting the letters patent.

14. Letters patent to F. A. Stevens of Nov. 5th, 1851, with the specifications.

WEST & BOND,
Solr's for Comp't.
GEORGE PAYSON,
Solicitor for Def't.

Correct:

THOMAS DRUMMOND,
Cir't Judge.

147 (Endorsed:) Filed September 18, A. D. 1875. W'm H. Bradley, clerk.

148 Afterwards, to wit, on the 9th day of October, A. D. 1875, said defendant filed in said clerk's office its bond in appeal in said entitled cause; which said bond is in the words and figures following, to wit:

Appeal bond.

Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY COMPANY.
} In chancery.

Know all men by these presents that we, The Chicago and Northwestern Railway Company, as principal, and Henry H. Porter, Sam'l M. Nickerson, and William H. Ferry, as sureties, are held and firmly bound unto Thomas Sayles in the penal sum of sixty-five thousand dollars ($65,000.00) to be paid to the said Thomas Sayles, his executors or administrators; to which payment, well and truly to be made, the said railway company binds itself and its successors, and the said Henry H. Porter, Sam'l M. Nickerson, and William H. Ferry bind themselves, their heirs, executors, and administrators, jointly, severally, and firmly, by these presents.

In witness whereof the said Chicago and Northwestern Railway Company has caused these presents to be signed by its president and its corporate seal to be hereto affixed; and the said Henry H. Porter, 149 Sam'l M. Nickerson, and William H. Ferry have hereunto set their hands and seals this twentieth day of September, A. D. 1875.

The condition of this obligation is such, that whereas the abovebounden, The Chicago and Northwestern Railway Company, hath taken an appeal to the Supreme Court of the United States to reverse the decree rendered against it by the name and style of The Chicago and Northwestern Railway Company in the above-entitled cause by the circuit court of the United States for the northern district of Illinois on the eighteenth day of September, A. D. 1875:

Now, therefore, the condition of this obligation is such, that if the above-named, The Chicago and Northwestern Railway Company, shall prosecute its said appeal to effect and without delay, and answer all damages and costs if it shall fail to make its appeal good, then this obligation to be void; otherwise to remain in full force and virtue.

[SEAL.] THE CHICAGO AND NORTHWESTERN RAILWAY COMPANY,
By ALBERT KEEP,
Its President.
HENRY H. PORTER. [SEAL.]
WILLIAM H. FERRY. [SEAL.]
SAM'L M. NICKERSON. [SEAL.]

Attest:
J. B. REDFIELD,
Ass't Sec'y.

150 Approved.

THOMAS DRUMMOND.

(Endorsed:) Filed Oct. 9, 1875. W'm H. Bradley, cl'k.

151 *Opinions of the court.*

152 SAYLES
vs.
CHICAGO & NORTHWESTEN RAILWAY CO.

Circuit court, northern dist. of Illinois.

Opinions of the court.

First opinion, February, 1865.

DRUMMOND, J.:

The letters patent in this case were granted to Henry Tanner, on the 6th day of July, 1852, covering what is called the double-acting car-brake. It is well known that cars were originally run with four wheels, a single car-brake being usually applied to them to retard or arrest the progress of the train. It became very important, when the railroad companies began to run cars with eight wheels, to have the brakes applied in such a way as to save the employment of numerous brakemen, and operate simultaneously upon all the wheels of the car, and that this should be done by an application of force at either end of the car, so that one man could act as brakeman upon two cars, instead of having three or more. It is this object which, it is alleged, was accomplished in this instance by pressing the brakes on all the eight wheels of the car simultaneously by the application of a force at either end by means of a windlass there placed.

Although the patent was issued to Tanner, he was not himself the inventor, but this claim was set up by Bachelder & Thompson, Tanner being merely their assignee. The claim, as set forth in the specification, is this: "What is claimed by us is to so combine the brakes of the two trucks with the operative windlasses or their equivalents at both ends of the car by means of the vibrating lever A, or its equivalent, or mechanism essentially as specified, as to enable the brakeman, by operating either of the windlasses, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car."

The case has been argued on the part of the defendant chiefly, I may say solely, on the ground that these parties, Bachelder & Thompson,

were not the original inventors of this improvement upon car-brakes. It is also said that if the invention was ever made by them it was abandoned; that it was not prosecuted with that diligence which the patent laws required. For the purpose of showing want of
153 novelty on the part of Bachelder & Thompson, the defendant relies mainly on two, or I may say on one, improvement in car-brakes, called Millholland's improvement, which was, it is conceded, prior in point of time to that of Bachelder & Thompson. Some stress is also laid upon an improvement Mr. Nichols adopted in Connecticut, which it is alleged contained in several particulars the same principle as that of Bachelder & Thompson, and was used prior to the invention made by them.

It becomes necessary, therefore, to ascertain when this improvement was first made by Bachelder and Thompson, and whether or not they abandoned it. The evidence in the case shows this to be the state of facts in relation to that matter; that Bachelder & Thompson, in the fall of 1846, substantially invented this method of applying the force to the car-brakes, and that in June, 1847, they filed their application with their model, and what purported to be specifications, in the Patent Office. They were not at all familiar with the method of obtaining a patent or with the law upon the subject, and they applied to a third party to assist them. The specifications which were filed, or what purported to be such, in the office were drawn up in a loose and very imperfect manner. The office itself was then overwhelmed with business, and applications were not taken up until long after they were filed. They, from time to time, called upon the gentleman whom they had requested to assist them, and letters were written to the Patent Office upon the subject, and in 1851, the application being still pending, in reply to some letters that were written, the agent of Bachelder & Thompson was told that the drawings and specifications as set forth were insufficient, and the further prosecution of an application for a patent in the case discouraged. However, upon a renewed effort on the part of Bachelder & Thompson, the officers in the Patent Office reconsidered the subject, the specifications were rendered sufficient, as was supposed, and a patent was finally issued. It thus appears that for several years, from 1847 to 1852, this matter was thus suspended in the Patent Office.

The first question that occurs is, whether these parties had neglected or abandoned their improvement in such a way as to make it public property, and I think they had not. The whole testimony shows that they had not abandoned what they considered to be an improvement to which they had a right under the law. Certainly they cannot be held accountable for the delays in the Patent Office, and the law by its terms provides for the perfection of imperfect and insufficient specifications even after the patent issues. A question connected with this is whether, when the application was made in June, 1847, there was substantially the improvement, the right to which was sought to be given to them by the letters patent in 1852, and I think there was. It is true there
154 was a change in the specifications as perfected and as originally filed, more having been claimed in the original specifications. Still, I think it is clear that they claimed in their original specifications substantially the method of combining the brake in the manner in which they set the claim forth in the last specifications upon which the patent issued. Besides, the patent law looks with indulgence upon the delays which arise from the circumstances of parties who may make an invention, and it is only when the invention is intentionally abandoned

or neglected, or the parties show by their acts that they have not done all they can do, that the law declares that they shall not be protected in their invention. Therefore I find that this invention was made in the fall of 1846, claimed by application in the Patent Office in June, 1847, and protected in law by the issuing of letters patent in 1852. Then, were they the first inventors of this improvement in car-brakes? I leave out of view all that is said in the testimony of what is called the Springfield brake. No particular stress is laid upon it in the argument of the defendant. It is not claimed or set up, I believe, in the answer.

The first question is in relation to what is termed the Nichols brake. I do not propose to dwell at any great length upon the testimony as to the time when this brake was used. M'r's Nichols, the wife of M'r Nichols (M'r N. having died in 1850), states in her deposition that her husband made a drawing of it in the spring of 1846. If so, of course the invention would be prior to that of Bachelder & Thompson, theirs not having been made until the fall of that year. But I think that the weight of the evidence is that the Nichols brake was not invented until the spring of 1847, and was not applied until 1848. We have constantly to bear in mind, in weighing the testimony of witnesses who speak of circumstances occurring many years ago, the liability to mistake the particular year, unless they have some evidence of a documentary character or otherwise, or some leading fact, as to which there can be no error, upon which they may rely to show the particular time.

This brake was applied upon what is termed a long baggage-car. The witnesses, Stockbridge and Fields, state that this car was not finished until the spring of 1848. Various other witnesses differ as to the time from M'r's Nichols, and she differs now herself in giving her deposition from what she stated when she gave her testimony in the railroad case tried in New York some years ago. Besides, she took an account-book to Fields and inquired of him as to the time her husband put on the brake, which shows that she really had no memory as to the time. Taking all the testimony together in relation to this Nichols brake,
155 it is clear, the weight of it is, that this invention was not made
by him prior to that of Bachelder & Thompson, even conceding that the two brakes are identical, as to which I gave no opinion.

The principal difficulty I have had in the case is in relation to the Millholland brake. One of the defendant's counsel has presented an argument in which he insists, with much force and plausibility, that the Millholland brake contains substantially the same principle as the Bachelder & Thompson brake, and that it was carried into practical effect by its use upon the cars.

We have, if I might be permitted to go out of the proofs in this case, a striking illustration of the uncertainty of human memory as to the time when this Millholland brake was first applied. When this brake first came before the court, it was insisted, and apparently proved, I believe, that the Millholland brake was invented and used in 1842. M'r Millholland says now in his deposition that he made and used it in 1843. But when we come to apply documentary evidence to the facts which are before us, I think it appears satisfactory that the Millholland brake was not used until 1845. But still if it were then used, and if it was a practical improvement, and similar in principle to that of Bachelder & Thompson, of course it prevents the patent of Tanner from operating. There is no doubt of this, that Millholland did invent a brake which operated in certain circumstances upon the two trucks by means of what is called a drum under the car, so that by the application of force at either end of the car, the wheels—all the eight wheels—were retarded.

The main questions are, whether it was a practical and successful improvement, and whether it was abandoned as a mere experiment. There never was any patent applied for or issued. It is conceded and the proof clearly shows that it was never actually applied in any instance except upon one car, and I think it is clear that it was thrown aside and abandoned by Millholland himself in 1845. And if it was not introduced until 1845, then instead of being used for eighteen months it was only used for a few months. The car upon which it was applied was used very seldom. It is also certain that it did not operate satisfactorily, and the brakemen complained that when used on the car the windlass-chains would break, or the car was liable to be thrown off. The Millholland brake was, in some respects, different from the Tanner brake. In the first place it operated by means of a drum upon which turned the chains to which the levers upon the brakes were attached. The brake of Bachelder & Thompson operated by means of a horizontal vibrating lever. The brake-levers are also differently arranged. In the case of Millholland's brake the drum was rigid, the brake-levers being pivoted in such a way that they did not operate with any degree of elasticity or self-adjustability. In this respect it would seem as though the two
156 brakes were different, but perhaps the "horizontal lever" of Bachelder & Thompson's brake may be said to be eqpivalent to the drum of Millholland's brake.

But I think the doctrine of equivalents should be critically scanned where there may be a difference in relation to two machines which in some respects operate by equivalent devices, and in other respects do not, to ascertain whether the one has become a practical machine and the other not. For instance, in relation to the drum, the result shows that there were defects in the Millholland brake which prevented it from becoming a practical, useful brake. It was used and abandoned. The reason for that is given by a witness who says that it was in consequence of the rigidity of these various levers, or what might be called levers; that if there was any defect in the shoes in any way, so that on applying force to the windlass at either end the power would be applied to but one of the shoes, the strain would tend to break the windlass-chains, before there was sufficient pressure of the shoes upon the wheels. One of the great objects sought by Bachelder & Thompson in their improvement was this: whether the wheels were running upon straight or curved lines, the shoes would all press simultaneously upon the wheels whenever force was applied, and by the elasticity of these various levers a defect in one of the shoes would not prevent the contact of the others. Now, I think these circumstances have great weight when we come to determine the question whether there was here an actual practical improvement in the car-brake which would prevent any one else from adopting a principle that might be in that brake, and thereby perfecting the device.

I have come to the conclusion that there was not in this Millhollan brake that kind of practical operating brake which would prevent any one else from obtaining a patent for a brake which would accomplish the object, which, it is clear, Millholland had in his mind, but does not seem to have carried out into practical operation by the brake which he made and applied in 1845.

I admit fully the law, as contended for by the counsel for the defendant, that when an improvement or a machine has been once made and used, it is not necessary that it should be used up to the time that another person may make a similar improvement. If it has been once used, and is a practical improvement or machine, no one else can claim

to be the inventor. But in this case I think there was not that practical improvement of the brake discovered and used by Millholland which would prevent these parties from obtaining a patent for a brake such as that which was finally set forth in their specifications. I would refer particularly to the testimony of the only expert introduced. It seems to me that he is a very clear-headed man, and his testimony sets
forth with great distinctness the difference between the Mill-
157 holland and Springfield brakes, and the brake of Tanner. And
this difference which he refers to ought to have great weight when we come to consider whether, in point of fact, such a brake as Millholland used did really prevent any other person from obtaining a patent for a double-acting brake similar, in some respects, but which would successfully arrest the progress of railroad trains. The conclusion to which I have come is that Bachelder & Thompson were the inventors of this improvement, for which letters patent were issued to Tanner; that they never abandoned it from its discovery in the fall of 1846, and that there has been nothing shown in the evidence which, fairly considered, would deprive them or their assignee of the right to it.

No question has been made in relation to the infringement. It is denied in the answer, but it is not insisted on or pressed in the argument. Of course, in deciding this case I do not in any respect change the views which I announced on a former occasion, as to the distinction between the Stevens and the Tanner brake. The only claim which the plaintiff would have in this case would be for any damage which he may have sustained in consequence of defendant having used the invention of Bachelder & Thompson. But if the brake of Stevens, or any other person, shall include the invention of Bachelder & Thompson as a part of his brake, the plaintiff will not be prevented from claiming damages for the use of that part.

Second opinion, June, 1871.

Drummond, J.:

This case was before the court some years since, and an opinion given upon the points then submitted and argued.

The court then decided that Bachelder & Thompson were the inventors, in 1846, of the combination described in their specifications of the brakes of the two trucks with the operative windlasses by the means designated, so that the brakeman, by operating either windlass at the end of a railroad-car, could apply the brakes of both trucks simultaneously to the wheels to which the brakes were respectively attached; and that the patent which was issued to Henry Tanner, the assignee of Bachelder & Thompson, in 1852, was valid.

This decision was of course made on the case as then presented, and on the proofs then before the court. The question of infringement was not at that time seriously controverted, and an interlocutory order was made, referring the case to a master. Afterwards an application was made to open this decree because of new evidence discovered affecting the question of novelty of the claim of Bachelder & Thompson, and the
court permitted additional proofs to be taken.
158 The case has been again argued upon the new evidence, and
upon the last argument it has been insisted that the defendant does not infringe the Tanner patent, even if valid.

The new evidence relates mainly to two brakes, which, it is alleged, anticipated the discovery of Bachelder & Thompson. 1st. The brake upon the car John Tyler, used on the Camden & Amboy Railroad. 2d. The Stanley-Talson brake used on the same road.

In 1843, M'r Tyler, then President of the United States, made a visit to the Eastern States, and a car was fitted up with unusual effort and expense to carry the President over the Camden & Amboy Railroad, on his way east.

This car was so unique among the cars of the time that it thenceforth bore the name of the President. As a part of its appointments the defense claims that it had a double brake, combining the two trucks, and operating in the same way and producing the same effect as the Tanner brake. If that were so, then undoubtedly it anticipated the invention of Bachelder & Thompson, because it is certain that this special car was constructed, and conveyed the President over the Camden & Amboy Railroad, in 1843. The serious question, therefore, on this part of the case is, when was the double brake put on the John Tyler car.

The evidence is curious on this point. Several witnesses, many of them undoubtedly with full conviction, declare that the car had a double brake on when it started out in 1843, and when the President rode on it. Many others declare that the double-brake was not put on the car till 1851, and that it was the Hodge brake, an invention subsequent in time to that of Bachelder & Thompson, now covered by the Tanner patent, and hence generally called the Tanner brake.

It is necessary to determine in the midst of this great conflict of evidence where the truth is, in the judgment of the court; and looking at all the facts bearing on the point, I think that the witnesses who state that the double brake, combining the two trucks in the manner of the Tanner patent, was on the John Tyler car in 1843, are mistaken, or testify untruly.

It is said that the evidence for the defense in this particular is positive, and on the other side negative; that is so, and if it depended upon that circumstance alone, then it might be the positive testimony would outweigh the negative. But there are various well established facts inconsistent with this positive evidence. It is clear in the examinations which were made among the employés of the Camden & Amboy Railroad, growing out of the suits at Albany, brought by M'r Tanner
159 against the New York & Erie Railroad Company, and the Hudson River Railroad Company, which were numerous and thorough, that the double brake on the John Tyler car did not assume a tangible shape then, though application was made to some of the witnesses who now assert its existence in 1843. These examinations were made in 1853 and 1854, and seem to have been conducted in entire good faith to ascertain facts to enable the railroads to defend against the Tanner patent. The defense was unsuccessful.

The testimony tending to establish the attachment of a double brake to the John Tyler car in 1851, is of itself in the nature of positive evidence, and therefore is entitled in effect to the consideration of that kind of evidence.

There is one fact established which, unexplained, seems to be conclusive upon this part of the case. The counsel for the defense do not controvert the value or the utility of the Tanner brake. Now, if there was such a brake in substance or effect on the car referred to, then it was not attached to the other cars of the Camden & Amboy Railroad, because the proof appears ample that some years after 1843 the cars of the railroad company were run generally with the single brake alone; and if it were true that a double-acting brake of the kind included in the model of the John Tyler car produced at the hearing existed in 1843, it is scarcely possible to doubt that it would have gone into general use at once on the road.

In addition to this, many of the witnesses for the defense, who originally spoke with as much confidence as any others, afterwards retracted, and admitted that they were in error when they asserted the double-acting brake was on the Camden & Amboy Railroad in 1843.

The testimony shows that in 1842 a man by the name of Stanley made and applied a brake in some respects, at least, similar to that of the Tanner brake.

The materials of which it was composed were too slight, and it proved a failure. Afterwards one Talson strengthened them, and perhaps made some slight changes, and the brake was used on several occasions. It seems afterwards to have been thrown aside. For this different reasons have been given. The position taken that the John Tyler car-brake, as claimed, and the Stanley-Talson brake, also as claimed, were continued in use for several years after 1842 and 1843, I consider not sustained by the evidence. There was no successful practical double brake on the Camden & Amboy Railroad in operation prior to the invention of Bachelder & Thompson.

It is the history of inventions that when different persons are exploring or experimenting in the same field, many efforts, which ultimately turn out to be failures often come very near success; and when other efforts have proved successful, these last should not be deprived
160 of the results of success simply becausd others have come near to them. The fact that the Camden & Amboy Railroad was without a successful double-acting brake till the Hodge brake was introduced, is strong evidence against the claim set up now both for the brake of the John Tyler car and that of Stanley & Talson. It is asked how often shall a brake be used to antedate the invention of Bachelder & Thompson? The answer is, until that which is claimed as new in the patent is complete, although the thing may have been imperfect as an instrument or machine. If it were manifest that the thing claimed in the patent was accomplished, one use would be sufficient. If the construction of the thing of itself demonstrated that it was within the principle here stated, then perhaps no use need be established. It might then be said to prove itself. But in most cases sufficient use must be shown to prove that it will accomplish what is claimed; and while this is generally true of a patent, it is equally true of that by which a patent is sought to be defeated; otherwise it rests in the region of mere experiment.

The argument that there has been no infringement is this: Brakes have been applied to the trucks of railroad cars; they have been connected together, therefore Bachelder & Thompson could only claim some peculiar method of making the connection. All other methods were left open, and if the connection of the brakes was in a different way from that of Bachelder & Thompson, then there could be no infringement. The defendant's brake—that of Stevens—has a different mode of connecting the two systems of brakes, consequently there is no infringement.

We must bear in mind that the principle of the Tanner brake is the combination of the two series of brakes, counting the brakes at each end of the cars as a series, with each other and with the windlass at each end, so that all the brakes can be applied at once at either end by the brakeman. This combination is produced by means of what is termed a vibrating lever, essentially as specified, and the question is, whether the Stevens brake, that being used by the defendants, accomplishes the same result by analogous means or equivalent combinations within the terms prescribed by the Supreme Court in the case of

McCormick vs. Talcott (20 Howard R., 402). The view the court took of the Stevens brake on a former occasion was that it was distinct from the Tanner brake in this: that by some new and original devices Stevens obtained an equality of force upon the brakes, thus retarding the wheels uniformly, and therefore the Stevens patent was sustained. That case went to the Supreme Court of the United States. There was a difference of opinion in the court on some of the points decided in this court, and the case was never reported, the decree being affirmed 161 by a divided court; but it is understood that the court was unanimous in sustaining the validity of the Stevens patent. The only question, therefore, is whether the Stevens brake, as constructed and operated, embodies, in effect, the invention of Bachelder & Thompson by combining the brake series of the different trucks with the windlasses, so that they can be operated at once from either end of the car. The rule laid down upon the subject of infringement by the Supreme Court of the United States in the case of Seymour vs. Osborne (11 Wallace, 516), is that inventors of a combination are as much entitled to suppress every other combination of the same ingredients to produce the same result not substantially different from what they have invented and caused to be patented, as any other class of inventors, and they have a right to invoke the doctrine of equivalents to that extent to sustain their invention.

It must always be very much a matter of judgment to the eye in the examination of two machines and in observing their mode of operation, whether the one, in the whole or any of its parts, is a mere colorable or formal alteration of the other. If a patentee has invented a combination of two or more old things so as to produce a new and useful result, then he has a right to treat as infringers all who have used his invention in order to accomplish something more or better, when without the aid of such invention it could not be effected.

According to the view which the court takes of the evidence, Bachelder & Thompson first successfully combined the two systems of brakes with each other and with the windlasses, so that all the brakes could be applied at either end of the car. This was their invention, secured by letters patent to Tanner. No one else had the right to take what may be termed the inventive principle of this combination, use it, and evolve something different and better by additional devices for which last a patent could be sustained. This we think Stevens did. What he invented he has a right to retain under his patent, but he cannot use the invention of Bachelder & Thompson without the consent of the patentee or his assignee.

The court took this view of the case before, though the question of infringement was not specially pressed on the former argument, and the court, though it may be admitted it is a point of some nicety, has seen no reason to change its opinion.

It may be that the invention of Bachelder & Thompson, without the improvement of Stevens superadded, may not be of very great value, but that question is not now before us for decision. That will be considered when the proofs upon that point are taken up and reported to the court.

Decree accordingly and reference to a master.

162 NORTHERN DISTRICT OF ILLINOIS, *ss:*

I, William H. Bradley, clerk of the circuit court of the United States for said district, do hereby certify the above and foregoing transcript as contained and set forth in the several parts or volumes hereto attached, and marked respectively No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7, No. 8, and No. 9, is a true and correct transcript of the record and the proceedings had in said court in the cause wherein Thomas Sayles is the complainant and the Chicago and Northwestern Railway Company is the defendant, as the same appears from the files and records of said court now remaining in my custody and control.

In testimony whereof I have hereunto set my hand and affixed the seal of said court at my office at Chicago, in said district, this 4th day of November, A. D. 1875, and of our Independence the 100th year.

[SEAL.] W'M H. BRADLEY, *Clerk.*

163 *Copy of certified copy of assignment from L. F. Thompson and A. G. Batchelder to Henry Tanner.—Dated April 1st, 1852.*

Whereas we, Lafayette F. Thompson, of Charlestown, and Asahel G. Bachelder, now or late of Lowell, in the State of Massachusetts, have invented an improved mode of operating the brakes of railway-cars, and have applied, or intend to apply, for letters patent of the United States of America therefor:

Now, therefore, this indenture witnesseth that for and in consideration of one hundred dollars in hand paid, the receipt whereof is hereby acknowledged, I have assigned and set over, and do hereby assign, sell, and set over, to Henry Tanner, of Buffalo, in the State of New York, all the right, title, and interest whatsoever which we now have, or by letters patent would be entitled to have and possess, in the aforesaid invention; the said indention being described in the specification as prepared and executed by us, or to be prepared and executed by us, for the obtaining of said letters patent, the whole to be held and enjoyed by the said Henry Tanner and his legal representatives to the full extent and manner in which the same would have been, or could be, held and enjoyed by us, had this assignment never been made.

And we do, by these presents, authorize the Commissioner of Patents to issue the said letters patent to the said Henry Tanner and his 164 legal representatives, as the assignee of our whole right and title to the same, and to the new invention aforesaid.

In witness whereof we have hereto set our signatures and seals this first day of April, A. D. 1852.

LAFAYETTE F. THOMPSON. [L. S.]
ASAHEL G. BACHELDER. [L. S.]

Witness:
R. H. EDDY.

Received and recorded at the United States Patent Office April 15, 1852, in Liber P^2, page 346.

165 Know all men by these presents that I, Henry Tanner, of Buffalo, Erie County, New York, for and in consideration of five thousand dollars to me in hand paid, by Thomas Sayles, of Lansingburgh, Rensalaer County, New York, have sold, and by these presents do sell, assign, transfer, and set over to the said Sayles all the right, title, interest, and claim which I have or may have in or to any and all damages and profits and right of action for the same, either at law or in equity, growing out of the unlawful use or manufacture or vending by any person or persons or company or companies, whether incorporated or otherwise, of the inventions covered by letters patent of the United States granted to me, said Tanner, on the 6th day of July, 1852, for an improvement in railroad-car brakes, so far as said damages and profits have not been

settled for, and I do hereby authorize said Sayles to bring and prosecute all actions and suits, whether at law or in equity, which he may deem proper, and either in my name or otherwise, to recover such damages & profits, but at his costs & charges, & for his own benefit and profit.

Witness my hand and seal this 23d day of January, 1855.

HENRY TANNER. [SEAL.]

Witnesses:
SAM'L BLATCHFORD.
B. W. GRISWOLD.

166 UNITED STATES PATENT OFFICE.

Received the 24th day of Jan., 1855, & recorded in liber M 3, page 511, of Transfers of Patent Rights.

In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

[SEAL.] C. MASON,
Com'r of Patents.

Ex'd.—C. E. N.

Exhibit D, referred to in the examination of A. Eringle in Sayles vs. C. & N. W. R. R.

J. T. MOULTON.

167 The U. S. Patent Office to all persons to whom these presents shall come, greeting:

This is to certify that the annexed is a true copy from the records of this office of an assignment from Henry Tanner to Thomas Sayles, under letters patent granted to Henry Tanner, dated July 6th, 1852, for "imp't in railroad-car brakes."

In testimony whereof I, Ellis Spear, Ccting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this fourteenth day of December, in the year of our Lord one thousand eight hundred and seventy-four, and of the Independence of the United States the ninety-ninth.

[SEAL.] ELLIS SPEAR,
Acting Commissioner.

Whereas letters patent were granted to Henry Tanner, of Buffalo' county of Erie and State of New York, by the United States Government, bearing date July 6th, 1852, for an improvement in railroad-car brake, on an application made therefor by L. F. Thompson and A. G. Bachelder, of Massachusetts, and duly assigned to the said Tanner.

And whereas Thomas Sayles, of Lansingburgh, in the State of
168 New York, has this day purchased of the said Henry Tanner all his remaining right, title, and interest in and to said patent, for said improvement in railroad-car brake, for the unexpired term thereof, and of any extension that may be granted therefor, excepting the following reserved territory and railroad corporations, to-wit: All of the States of Ohio, Indiana, and Illinois (excepting the Illinois Central Railroad, which is hereby sold to said Sayles), and reserving unsold further the Michigan Central Railroad and the Michigan Southern and Northern Indiana Railroad, and the Ohio and Mississippi Railroad, and the Louisville and Nashville Railroad, and a horse-railroad round the Ohio Falls, from Louisville to Portland, about three miles more or less, and the Louisville and Frankfort Railroad; also the Hudson River Railroad; also the New York Central Railroad; also the Ranselear & Sara-

toga Railroad; also Saratoga and Washington Railroad; also the New York and New Haven Railroad; also New York and Harlem Railroad; also the Housitonic Railroad; also Long Island Railroad; also Baltimore and Ohio Railroad; also Baltimore and Susquehanna Railroad; also Elmira and Canandaigua Railroad; also Canandaigua and Niagara Falls Railroad; also Buffalo and State Line Railroad; also Fitchburg Railroad; also Boston and Worcester Railroad; also Western Vermont Railroad; also the Cheshire Railroad; also the Concord Railroad; also the Troy and Boston Railroad; also the Worcester and Nashua Railroad; also the Eastern Railroad; also the Boston and Maine Railroad; also the Canal Railroad; also the South Shore Railroad; also the Richmond and Petersburgh Railroad; also the Vermont Valley Railroad; also the Portland, Saco and Portsmouth Railroad; also Boston and Lowell Railroad; also Boston and Providence Railroad; also the Old Colony Railroad; also the Providence and Worcester Railroad; also the New London, Wiliamantic and Palmer Railroad; also the (Stonington and Providence); also the New Haven, Hartford and Springfield Railroad; also the Buffalo and New York City Railroad; also the Buffalo, Corning and New York Railroad; also the Erie and Northeast Railroad; and has paid me the just and full sum of twenty-five thousand dollars for the territory hereby sold, the receipt whereof is hereby acknowledged before the delivery of this deed: Now know, therefore, all men by these presents that I, the said Henry Tanner, have sold, and by these presents do hereby sell, assign, transfer, and set over to the said Thomas Sayles all my right, title, interest, and claim whatsoever which I have or may have in and to said invention and patent, and any extension thereof that may hereafter be granted (excepting the territory as above reserved) by reason of said letters patent or otherwise, giving and granting to the said Sayles and his legal representatives the full power to make, use, vend, and sell to others to make, use, and vend, the said invention in all cases as fully and freely as I might or could have done had this bargain and sale not have been made; and the said Henry Tanner doth hereby covenant to and with the said Thomas Sayles that he is now the lawful owner and holder of the said letters patent, and that he has not sold to any person or persons whomsoever, or to any corporations, any interest in said letters patent, or any use or vend the improvement aforesaid except as herein-above mentioned.

Witness my hand and seal at the city of Albany this thirteenth day of July, 1854.

HENRY TANNER.

In presence of—

A. ENRIGH.

Rec'd & recorded July 19th, 1854.

D. P.

171 Whereas letters patent were granted to me, the undersigned, Henry Tanner, of the city of Buffalo & State of New York, as the assignee of L. F. Thompson, of Charlestown, Mass., and A. G. Bachelder, of Lowell, Mass. (by the United States), for a new method of applying & using railroad-brakes, which letters patent bear date July 6, 1852, and are numbered 9109 C; and whereas Thomas Sayles, of Lansingburgh, New York, has this day purchased of me all my remaining right, title, & interest in and to the State of Illinois, & also the State of Kentucky, to wit, the Louisville & Nashville Railroad being heretofore excepted in a previous sale to said Sayles, and has paid me the just & full sum of two thousand dollars therefor, the receipt whereof is hereby

acknowledged; and this sale and transfer is intended to include, & does hereby assign all damages, or claims for damages, due me by reason of the use of said brake by any parties within said territories: Now, therefore, I do hereby sell, assign, & transfer to said Sayles all the right, title, claim, & interest whatsoever I may have by reason of said letters patent aforesaid, at this date, in the above-described territories, as fully and as perfectly as I might or could have used the same had this bargain & sale not have been made.

Witness my hand & seal this fourth day of April, A. D. 1859.

H. TANNER.

172 In presence of—

SAMUEL WILKINSON.

U. S. PATENT OFFICE.

Received & recorded July 5, 1859, in liber C^5, page 263, of Transfers of Patents. In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

W'M D. BISHOP,
Com'r of Patents.

173 No. 9109.

The United States of America to all to whom these letters-patent shall come:

Whereas Lafayette F. Thompson, of Charlestown, Mass., & Asahel G. Bachelder, of Lowell, Mass., have alleged that they have invented a new and useful improvement in railroad-car brakes (they having assigned their right, title, & interest in said improvement to Henry Tanner, of Buffalo, N. Y.), which, they state, has not been known or used before their application, have oath that they are citizens of the United States; that they do verily believe that they are the original and first inventors or discoverers of the said improvement; and that the same hath not, to the best of their knowledge and belief, been previously known or used; have paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are, therefore, to grant, according to law, to the said Henry Tanner, his heirs, administrators, or assigns, for the term of fourteen years from the sixth day of July, one thousand eight hundred and fifty-two, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Thompson & 174 Bachelder, in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed. Given under my hand at the city of Washington, this sixth day of July, in the year of our Lord one thousand eight hundred and fifty-two, and of the Independence of the United States of America the seventy-seventh.

[SEAL.] ALEX'R H. H. STUART,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.

THO'S EWBANK,
Commissioner of Patents.

175 **The schedule referred to in these letters patent and making part of the same.**

To all persons to whom these presents shall come:

Be it known that we, Lafayette F. Thompson, now or late of Charlestown, and Asahel G. Batchelder, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful mode of operating the brakes of railway cars; and we do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings, figure 1 denotes a top view of the platform-frame of a long car resting on two truck-frames, the same also exhibiting our invention as applied to the brakes of the wheels of its two truck-frames.

Figure 2 is a side elevation, and figure 3 a vertical central and longitudinal section of the same.

In the said drawings, A denotes the platform of an eight-wheel car, resting on two truck-frames B C.

D D′, E E′, are the wheels of one truck frame, while F F′, G G′, are those of the other truck-frame. H I K L are the axles, while M N O P are the four sets of brakes applied to the wheels.

Each set of the brakes is connected to a vibrating lever, Q, R, S, or T, which enables the sets of brakes to swing either towards or away from their respective sets of wheels. In the above-mentioned drawings, the fulcra of these levers are at their upper ends, as seen at *a a*, &c.

Under the middle of the car-platform, we arrange a lever A′ that turns horizontally on a centre-pin B′. A rod C^2 or D^2, or its equivalent, is jointed to each end of the lever A′, and is extended from thence towards the end of the car, one rod being extended towards one end while the other is carried towards the opposite end. Each rod is attached to a cord or chain *b′*, at its end, that is wound on the barrel of a windlass E^2 or F^2, fixed on the adjacent end of the platform, there being one windlass at each end of the platform.

Between the fulcrum of the lever A′ and each rod C^2, D^2, there is another rod or chain, as seen at G^2 H^2, which is jointed at one end to the lever A′, and has its other end jointed to the upper arm of one of two secondary levers I′ K′.

The lower end of the lever I′ is jointed to the set of brakes N, while the lower end of the lever K′ is similarly jointed to the set of brakes O. Rods M′ N′ are respectively jointed to the secondary levers between their lower and upper ends, and extend therefrom, and are jointed at their opposite ends to the set of brakes M P.

Under such circumstances, if a person rotates either windlass E′ or F′ so as to wind up its chain, he will produce a draft on the lever A′ that will cause all the brakes to simultaneously close down upon their respective sets of wheels.

From the above it will be seen that a brakeman at either end of the car, by simply turning the windlass at such end, can simultaneously operate or make bear against their wheels all the sets of brakes.

Our improvement can readily be applied to sets of brakes arranged between the wheels, as well as those where the brakes clasp each wheel on its two opposite sides.

The principle of arresting or retarding the progress of two or more cars while in motion on a railway, by the momentum of one or more of

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them being made to act on the friction-brakes of the said cars through the intervention of any suitable mechanism combined with the bumpers and the brakes, or the combination of the brakes and bumpers and a mechanism that will enable the momentum of one or more of the cars acting against the bumpers to force the brakes against the wheels, is not herein claimed; nor is it herein claimed to apply such momentum for such purpose by a mode wherein the brake apparatus is so combined with the axle of one of the wheels by means of a fast pulley on such axle, an endless belt passing around such pulley and a loose pulley on another axle or shaft, a clutch applied to such loose pulley and the second axle or shaft, whereby it may be made to rotate by the rotation of the axle of the wheels; and finally a mechanism or apparatus connecting the second shaft with the brakes of one or both trucks of a car, and made to so operate, when the loose pulley is clutched to its shaft, as to cause the brakes to be forced or drawn against the wheels—for such mode (it being that invented by George S. Griggs and patented December 31st, 1839) of causing the momentum to operate to arrest the velocity of a car or train of cars differs essentially from the invention hereinbefore set forth and represented in the accompanying drawings; for the friction of the wheels on the rails and the momentum of the moving carriage are employed to put in motion machinery that is brought into action on the brakes, or caused to act on them, when connected with the rotating pulley put in motion by the pulley of the axle of the wheels, the attendant or brakeman only performing the office of moving the sliding part of the clutch: but,

What is claimed by us is, to so combine the brakes of the two trucks with the operative windlasses or their equivalents, at both ends of the car, by means of the vibrating lever A′, or its equivalent, or mechanism essentially as specified, as to enable the brakeman, by operating either of the windlasses, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car.

In testimony whereof we have hereto set our signatures this eighth day of April, 1852.

A. G. BATCHELDER.
LAFAYETTE F. THOMPSON.

Witnesses:

DANIEL T. RICHARDSON, } to A. G. Batchelder.
NAHUM LEONARD, j'r, }
P. C. FREEMAN, } to Lafayette F. Thompson.
MILON C. MCCLURE, }

(Here follows diagram, marked page 175.)

176 The U. S. Patent Office to all persons to whom these presents shall come, greeting:

This is to certify that the annexed is a true copy from the records of this office of the specification and drawing in the matter of the letters patent granted Francis A. Stevens, dated Nov. 25th, 1851, No. 8552, for "imp't in railroad-car brakes."

In testimony whereof I, Sam'l A. Duncan, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this 29th day of December, in the year of our Lord one thousand eight hundred and seventy-one, and of the Independence of the United States the ninety-sixth.

[SEAL.]

SAM'L A. DUNCAN,
Acting Commissioner.

177 Francis A. Stevens, of Burlington, V't. Letters patent No. 8552, dated Nov. 25th, 1851.

To all whom it may concern:

Be it known that I, Francis A. Stevens, of Burlington, in the county of Chittenden, and State of Vermont, have invented a new and useful improvement in railroad-car brakes, and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, which forms part of this specification, and represents a longitudinal section of the running-gear of an eight-wheeled car with my compound compensating brake applied thereto.

My improved railroad-car brake is constructed in such manner that the friction-shoes of all the wheels of the car are brought into action simultaneously, and each shoe throughout the whole series is pressed against its respective wheel with the same amount of force.

In the accompanying drawing A is the frame of the car, and B B are the frames of the two four-wheeled trucks. Each wheel, C, of each truck is fitted with a friction-shoe, D, and the two friction-shoes of each pair of wheels are connected by a brake-beam, E, that extends across the truck. Each brake-beam is connected at its middle with the lower arm *g* of an upright brake-lever, H; and the fulcrums or turning-points of the two brake-levers of a truck are also connected by a link-rod, *f*. The
upper arm *i* of the brake-lever which is nearer the end of the car
178 is connected by a rod or chain with the brake-wheel, and the
upper arm *e* of the brake-lever nearer the middle of the car is
connected by a rod, *j*, with the upper arm of the corresponding brake-lever of the other truck.

It will now be seen that if a force be applied to draw the chain at one end of the car in the direction indicated by the arrow *k*, while the chain at the opposite end remains stationary, the whole series of levers and shoes will be moved, and the shoes will be pressed against their respective wheels with equal force; for the force exerted upon the first lever is propagated, by means of the link-rods, to the succeeding ones. Thus, for example, if the longer and shorter arms of the levers bear to each other the relation of 3 to 1, and the chain be drawn with a force of 100 pounds, the pair of shoes operated by the first brake-lever will be pressed against their wheels with a force of 300 pounds, while the fulcrum-rod *f* will be drawn in the direction indicated by the arrow *l* with a force of 300+100=400 pounds. The fulcrum of the next succeeding brake-lever having thus a force of 400 pounds applied to it will move, and as its arms bear to each other the above-stated relation of 3 to 1, its shorter arm will press forward its shoes with a force of 300 pounds, while the longer arm will act through the link-rod *j* upon the longer arm of the next succeeding brake-lever with a force of 100 pounds. This latter will act upon its respective shoes in the same man-
ner as the first lever in the series and with the same force. The
179 pressure upon its fulcrum will also be communicated to that of
the last brake-lever, which will thus act in the same manner as
the second one in the series. It is therefore evident that by connecting the brake-levers alternately by their arms and fulcrums, as herein set forth, the force exerted to move one will be propagated throughout a series of any number.

It is evident that this system of brakes is not confined in its application to a single car, but that the force applied to a single brake-wheel may be propagated throughout the whole train by merely connecting the brake-chain of each car with that of the succeeding one. In this case the upper arm of the last brake-lever in the train will become the fixed point in the whole series, and all the levers will be moved to press their respective friction-shoes against their wheels with the same force as the one which is moved directly by the brake-wheel chain.

The construction and arrangement of this system of car-brakes can be variously modified without affecting the principle upon which it acts. Thus, for example, the brake-levers may be levers of the second order, their fulcrum being at their lower extremities and the brake-beams being connected with the levers at points intermediate between their lower and upper extremities. In this case the lower extremities or fulcrum of the two levers of each truck will be connected by a rod, the 180 upper extremity of the brake-lever of each truck further from the adjacent brake-wheel will be connected therewith by a chain, and the upper extremities of the other two or outermost brake-levers will be connected by a rod.

What I claim as my invention, and desire to secure by letters patent, is the combination and arrangement of the levers, link-rods, and shoes, or rubbers, substantially as herein described, whereby each wheel of both trucks of a car is retarded with an uniform force when the brake is put into operation.

In testimony whereof I have hereunto subscribed my name.

F. A. STEVENS.

Witnesses:
AMASA DREW.
JAMES H. FISK.

Ex'd.—N. F. S.

(Here follows diagram, marked page 180.)

180½ *Exhibit No. 4, in Supreme Court Record.—W'm H. Bradley, Clerk.*

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.
} In chancery.

(Indorsed:) Thomas Sayles vs. The Chicago & Northwestern Railway Company. Exhibit No. 3, Supreme Court Record. W'm H. Bradley, clerk.

181 In the circuit court of the United States of America, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company.
} In chancery.

Goodwin, Larned & Goodwin, for complainant.
Blodgett & Winston, for defendant.

Testimony for the complainant.

M'r Goodwin offers in evidence exemplification of letters patent granted to Henry Tanner, assignee of L. F. Thompson and A. G. Bachelder, for improvement on railroad-car brakes, dated July 6th, 1852, marked "Exhibit E."

Assignment—Henry Tanner to Thomas Sayles, dated July 13th, 1854, marked "Exhibit A."

Assignment—Thompson and Bachelder to Henry Tanner, dated April 1st, 1852, marked "Exhibit B."

182 Assignment.—Henry Tanner to Thomas Sayles, dated April 4th, 1859, marked "Exhibit C."

Assignment.—Henry Tanner to Thomas Sayles, dated January 23d, 1855, marked "Exhibit D."

A. Emigh was examined as a witness to prove signature of subscribing witnesses to Exhibits A and D.

E. M. Hall was examined as witness to prove signature of subscribing witnesses to Exhibit C.

LESTER L. BOND, being duly sworn, says:

My name is Lester L. Bond; I am thirty-two years of age; I reside in the city of Chicago; I am an attorney at law.

1st int. Please state what experience, if any, you have in mechanics and in the construction and principle of labor-saving machines.

A. I was an operative mechanic for nine years, and used a number of different kinds of machines; and since I have been at the bar I have devoted considerable time to the construction of machinery in soliciting patents.

2d int. Have you been called and examined as an expert in questions on patents?

A. I have.

3d int. Are you acquainted with the patent specifications and drawings issued to Henry Tanner, above, marked "Exhibit E?"

A. I am.

4th int. State whether or not you are acquainted with the car-brake called the Stevens brake?

A. I am. I have seen it in actual operation and in model, and have also examined a certified copy of Stevens' patent from the Patent Office.

(The witness is here shown a model marked "No. 1, J. T. M.," and is asked):

183 5th int. What brake is that a model of?

A. Of the Stevens brake.

6th int. Do you know what form of brake is in use by the defendants on their passenger or other cars upon their road? If so, please state in what form they are constructed.

A. I have seen the Stevens brake on the passenger and baggage cars of the defendants, and they are made in the form of the model, No. 1, here shown.

7th int. Please state whether, in your judgment, the brake, as you found the same constructed and in operation on the defendants' cars (and represented in said model No. 1), substantially embodies the invention contained in the mechanism described in said patent to Henry Tanner?

A. In my judgment, the said brake in use by the defendants does substantially contain the invention described in the Tanner patent

LESTER L. BOND.

Subscribed March 12, 1862.

The defendant's counsel, M'r Blodgett, waived cross-examination.

I. T. MOULTON,
Master in Chancery.

184 *Deposition of James Francis, taken at Baltimore, Md., 21st October*, 1862.

Present, Thomas Sayles, plaintiff; S. M. Whipple, for defendant.

My name is James Francis; I am forty-one years old; reside
185 in Baltimore County, Maryland, and my occupation a farmer. I
was employed on the Baltimore and Susquehanna Railroad in the year 1844. I was about nine months as a brakeman on the passenger-train, up to first of April, 1845. After that period I went on the freight-train. They were using whilst I was in the employ of said company, on all the passenger-cars and baggage-cars, the treadle-brake; I mean while I was employed on the passenger-train. I recollect a brake called the drum-brake, which was used after I left the passenger-train, on a passenger-car. At that time they had about four passenger and two baggage cars. The drum-brake could not, I think, be used on the passenger-car whilst I was brakeman without my knowing it.

Cross-examined:

Q. Was the treadle-brake a single-acting or a double-acting brake?

A. It was a single-acting brake; acted on four wheels.

Q. Was the drum-brake a double-acting brake, or a single-acting brake?

A. I don't know; I never used them.

Q. Did the drum-brake operate from either end of the car?

A. I don't know; I never used it.

Q. Did the drum-brake apply the power simultaneously upon all the wheels, and from either end of the car?

A. I don't know.

Q. Do you know if it was a double brake or a single brake?

A. I do not.

Q. Why do you call it a drum-brake?

A. Because it had a drum fixed under the car.

Q. What relation had this drum to the windlasses of the car and the brakes of the trucks?

186 A. I don't know.

Q. Then how are you prepared to state what brakes were and what brakes were not in use on any cars on the Baltimore and Susquehanna Railroad?

A. I can state what kind of a brake I worked with the passenger-cars; that was a treadle-brake, operated by the foot.

Q. You say you know of a drum-brake being used on a passenger-car after you left the passenger-train; what kind of a brake was it?

A. There was a drum underneath it, and it was called a drum-brake. I never used it. I judge it was operated by hand. I don't know if it was a single brake or a double brake. I was on the freight-train at that time, and had nothing to do with the passenger-train whatever.

JAMES FRANCIS.

Sworn to and subscribed October 21st, 1862.

J. HANAN,
U. S. Commissioner.

Deposition of John J. Elder.

My name is John J. Elder. I reside in the city of Baltimore, and am by trade a painter. I am about forty-four years old. I commenced working for the Baltimore and Susquehanna Railroad Company, I think in 1843. I worked at painting under William Benson, foreman of the paint-shop.

He remained foreman about between eighteen months and two years from the time I went there, when he left. I have been foreman since he left, and am now in the employ of said company.

187 I recollect painting a brake, which was called a drum-brake, shortly after Mr. Benson left. This brake was on a passenger-car called, I think, the "Maryland," and had just been put on the car. I painted it before it had been used on the road. I do not know how long this brake was used. I heard the teamsters (who drove the cars by horse-power from Bolten depot to North street) complain about the brakes not holding the car when going down the grade. The drum-brake had a drum under the centre of the car, and was operated by a crank from the end of the car.

Cross-examined:

Q. What brakes were in general use on the Baltimore and Susquehanna road at the time alluded to, that is, previous to your being foreman in the paint-shop?

A. They were called treadle-brakes, and applied by the feet.

Q. You speak of painting a drum-brake, so called; wherein does this brake differ from the treadle-brake? Please explain fully.

A. The drum under the car and the crank at the end of the car was the only difference I know of. I knew nothing about the workings of any of them. I never used them. This is all I know about it.

Q. Was the drum-brake a single-acting brake, that is, did it operate on one truck of the car or upon both trucks at one and the same time?

A. I don't know.

JOHN J. ELDER.

Sworn to and subscribed Oct. 21st, 1862.

J. HANNAN,
U. S. Commissioner.

188 *Deposition of Isaac Denmead.*

I reside in Alexandria, State of Virginia. I am 47 years old, and by profession master of machinery. I was foreman of the machinery department under Mr. Millholland ten years on the Baltimore and Susquehanna Railroad, now the Northern Central Railroad. After Mr. Millholland left I was master of machinery four years up to 1853. I recollect Millholland putting the drum-brake on a passenger-car in 1845. The drum-brake was in use only for a short time; was not used regularly. Albert Fisher was the engineer who ran the train on which the drum-brake was used. John Yakel was one of the brakesmen on that train. There were frequent complaints about this brake, such as the chains often breaking, and there was not sufficient power between the drum and the windlass. All the power there was was between the windlass and the drum. There was no leverage on the drum or the truck-levers, as near as I can recollect.

(The model now produced and shown to the witness, and marked "Millholland Model," I. H., and he says that it is about the thing. It is as near as he recollects like the original drum-brake.)

I recollect that the car on which this drum-brake was put on was repaired some short time afterwards, and the drum-brake was taken off and the single treadle-brake put on in its *in its* place. The drum-brake

was not put on the car after it was repaired. Mr. Millholland ordered the drum-brake to be taken off the car. The baggage-master, brakesman, and engineer who ran the train on which this drum-brake was used often made complaints of the chains breaking, and not sufficient power to hold it going down the grades, to myself, Mr. Millholland, and John C. A. Smith, foreman of the carpenter's shop. The trial
189 of this drum-brake proved a failure at that time and it was abandoned. The single treadle-brake was in use on the passenger-cars until I left the road in 1853. I recollect there was no leverage on the drum-brake, only what was gained on the windlasses. I recollect a long lever-brake with rock-shaft, that was attached to an engine-tender some time in the fall of 1846, and the paper marked B, now shown to me, is a correct representation of it. Figure 1 represents the wheels; figure 2 the brake-beams; figure 3 the rock-shaft; figure 4 the long side lever, and figure 5 the truck-levers. This brake was put on the tender Watson previous to the trial late in the fall of 1846. These truck-levers was put on vertical; afterwards changed to a horizontal position, as shown in paper marked B. There was another tender put on called the General Taylor, in 1847, with the same kind of brake. This could only be operated at one end at a time.

Q. Could this tender-brake, like Exhibit B, be operated from either end by lengthening out the rock-shaft and attaching another long lever at the other end, without having a man at each of the long levers?

A. I would have to say it could not be worked with the double levers without a man at the opposite end to unhook the lever.

Q. Would a brake like that shown in Exhibit B be a practical brake for passenger or baggage cars?

A. It would not, for the reason why, the end of this long lever would be thrown down on the platform so as to prevent passengers from getting on or getting off the cars, and the length of the lever would be objectionable.

Cross-examined:

190 Q. In your direct examination you speak of the treadle-brake and the drum-brake. Wherein do they differ one from the other? Please explain?

A. One is operated by the foot operating on a long lever, while the drum-brake is operated by the hand-windlass on both trucks. The treadle-brake is operated by the foot on the long lever on the single truck.

Q. Was the power applied by the drum-brakes to the brakes of both trucks from the windlass at either end of the car?

A. It was.

Q. Was this the first double brake within your knowledge?

A. Yes, sir.

Q. Was there any alteration made in this brake by M'r Millholland after it was first put on the car?

A. There was none to my recollection.

Q. Had Mr. Millholland wished to have increased the power of the brake upon the wheels of the car could he have done so; and if so, how?

A. He could have done so by reducing the size of the drum on which the chain rolled on between the drum and the brake-levers, and also increasing the fulcrum on the brake-lever. The one used had a fulcrum but no leverage.

Q. By whose direction was the brake, like Exhibit B, put upon the tender Watson in 1846?

A. By James Millholland.

Q. Was this brake susceptible of being operated from either end of the tender by applying another lever to the other end of the rock-shaft and lifting it instead of depressing, as was the case in operating said brake?

A. It was.

191 Q. Is the rock-shaft in Exhibit B the equivalent of the drum in Millholland's model; does it perform the same functions?

A. It does not practically; the rock-shaft has a lever attached and the drum has not.

Q. Is not half the diameter of any drum, cylinder, or circle the leverage of that circle?

A. It is.

Q. Then how do you say there is no lever in the drum?

A. Because the other half of the drum is not detached.

Q. Is not an arm extending from the centre of a rock-shaft equivalent to the half of the diameter of a drum whose diameter is double the length of that arm?

A. It is just the same; that is, working from the centre of each.

Q. Then is not the function of the arm upon a rock-shaft when revolved a quarter of a circle the same as that in revolving a drum a quarter of a circle?

A. It is the same, and they do form the same function.

Q. Was this tender-brake in use upon the tender of the Watson engine when you left the Baltimore and Susquehanna Railroad in 1853?

A. It was.

Q. You say, in your direct examination, in substance, that this tender-brake would not be a practical brake, when applied to a passenger-car, from the fact that the levers would be thrown down on the platform in the way of passengers, getting off or on the cars, and that the length of the levers would be objectionable. Could or could not these objections be obviated by attaching a windlass, chain, and rod from either end of the car to the arms upon rock-shaft, one opposite to the others?

192 A. It could.

Q. Did there, whilst you were master-mechanic of the Baltimore and Susquehanna Railroad, to wit, between the years 1848 and 1853, come to you a man who proposed to sell to said company a double-acting brake?

A. There was.

Q. Did you show to this man the double-acting brake on the tenders in use on said road?

A. I did.

Q. What reply did this man make to you?

A. I can't make use of his exact language, but the substance was that this brake on the tender was so near his own that he would not trouble me, that is the company.

Q. Did you know the name of that man?

A. I do not.

Q. Was his name Henry Tanner?

A. That is more than I am able to say. He showed a model that had a lever inside of each truck, and also outside of each truck. There was no lever under the centre of the car.

Q. About what year did this man call upon you?

A. About the year 1849.

Q. How do you fix the time that this man came to sell to the Baltimore and Susquehanna Railroad Company the said double brake already referred to?

A. I fix the time from the time M'r Millholland left the road. He left in the summer of 1848, and it was the following summer that this man offered to sell said double brake.

ISSAC DENMEAD.

Sworn to and subscribed Oct. 21st, 1862.

J. HANNAN,
U. S. Commissioner.

193 *Deposition of George Woods.*

My name is George Woods; I reside in the city of Baltimore; am forty-four years old; I am now clerk of the Richmond market; was formerly engineer on the Baltimore and Susquehanna Railroad, now the Northern Central Railroad. I commenced as fireman on the said railroad in 1839, and acted in that capacity to April the 1st, 1845. Then I took charge of the stationery engine in the shop, and remained in that capacity up to 1855.

During the time I was fireman they used on the passenger and baggage-cars the single treadle-brakes. I recollect there was a drum-brake put on the road in April, 1845. It was put on the passenger-car Maryland. The general complaint against this drum-brake was that it was inefficient; had not power enough to do its work; did not answer the purpose for which it was intended. These complaints were made by the engineer and brakesman who ran the train on which this brake was used. The car on which this brake was used was not used generally, from the fact that they had few passengers-cars and used this car when necessity compelled them.

I recollect seeing this car standing on the track in front of the shop a good share of the time. To the best of my recollection I saw it come out of the shop in April, 1845, with this drum-brake on. I recollect of seeing it in the shop when they were putting it on. The carpenters' shop was about 100 yards from the stationary engine which I was attending at the time. The drum-brake car was taken into the shop about the first of June, 1845, and the drum-brake taken off, and when I saw the car come out of the shop again it had on the old single treadle-brake.

The drum-brake was operated by a crank at each end of the car and operated on all eight wheels.

194 Cross-examined:

Q. Have you been examined about this drum-brake before this?

A. Yes, sir.

Q. How long since?

A. I believe in the neighborhood of two years; don't recollect distinctly, but think about that time.

Q. How old were you then?

A. I was forty-two years.

Q. Did you not state in that examination that you were forty years old?

A. I don't recollect distinctly what I stated.

Q. To the question how old are you, if you replied "I am forty years of age," did you answer truly?

A. I don't recollect distinctly what I answered.

Q. You say the drum-brake did not answer the purpose for which it was intended; for what purpose was it intended?

A. It was intended to check the speed of the train.

Q. Was it a double brake or a single brake?

A. It was a double-acting brake.

Q. Did it apply the brakes simultaneously on both trucks, and from either end of the car?

A. Yes.

GEO. WOODS.

Sworn to and subscribed Oct. 21st, 1862.

J. HANNAN,
U. S. Commissioner.

195 *Deposition of Robert S. Hollins.*

My name is Robert S. Hollins; I reside in the city of Baltimore, and am secretary of the Northern Central Railroad Company, and was the secretary of the Baltimore and Susquehanna Railroad Company since 1835; George Woods' name appears on the pay-roll of the company as working a stationary-engine during the month of April, 1845; he did not work that engine the previous month; he was fireman on the engine in the month of March, 1845; I find on the pay-roll that James Francis was second brakesman in the month of March, 1845; and in the month of April, same year, I find, under the head of "Remarks," "changed from passenger to burden train," and wages altered from $20 to 25 dollars per month; I find, from the same pay-roll, that John Yakel took James Francis' place as brakesman on the passenger-train on the 9th day of April, 1845; John Yakel's name is not on the pay-roll for March; William Benson's name is on the pay-roll as first painter during the month of March, and on the pay-roll of April up to the 11th, inclusive, and then under the head of "Remarks," "quit"; this was in 1845; John J. Elder is on the pay-roll for May, 1845, as first painter, and on the pay-roll for April as second painter; these pay-rolls are kept by myself, and I know them to be correct.

Cross-examination waived.

(Signed) ROB'T S. HOLLINS.

ROB'T S. HOLLINS, recalled by the plaintiff, says:

Our company has purchased the right to the "Tanner patent car-brake"; also the "Stevens' patent car-brake."

196 Cross-examined:

Q. In what year did your company purchase the said Tanner and Stevens' patent car-brakes?

A. I cannot say without having reference to the papers of the company.

Q. Will you produce said papers, and from them give the aforesaid date or year?

A. I will in the morning.

M'r Hollins reappeared this morning, Oct. 22d, and says:

On the 31st of July, 1853, the Baltimore and Susquehanna Railroad bought the patent-right of F. A. Stevens to his brake; and on February the 7th, 1854, bought Henry Tanner's patent-right for brake; those rights extended from Baltimore to Harrisburgh; we paid A. Emigh, agent for

Henry Tanner, for the use of his brake on the 20th of July, 1858. The Northern Central Railway Company bought the patent of Thomas Sayles, assignee of Tanner, the right extending from Harrisburgh to Sunbury.

Q. Who succeeded M'r Isaac Denmead as master of machinery on your road?

A. John C. Davis; it was while he was master of machinery that we bought the right to Stevens' and Tanner's brakes.

ROB'T S. HOLLINS.

Sworn to and subscribed Oct. 22d, 1862.

J. HANNAN,
U. S. Commissioner.

197 *Deposition of John Yakel.*

My name is John Yakel; I reside in the city of Baltimore, Maryland. I am about forty-two years old, and a conductor on the Northern Central Railroad; I have been engaged on said roads, that is the Baltimore and Susquehanna formerly, now the Northern Central Railroad, since some time in April, 1845; my first capacity was brakeman on the passenger-train, and I held that position for about two or three years; I was then appointed baggage-master, and held that situation some seven or eight years, and then was appointed conductor, which situation I now hold. When I first went there as brakeman they used the single treadle-brake on all the passenger and baggage cars.

A short time after I came there a brake was put on a car called the Maryland. The brake was called a drum-brake, or double-acting brake, or a brake acting on both trucks; I used the single treadle-brake on the passenger-car Maryland before the drum-brake was put on it; I never worked on any railroad till I went there in 1845.

I saw this car Maryland in the shop a short time after I came to work on the road, when they were putting this drum-brake on it. I used the brake after it was put on. The drum-brake worked very bad as compared to the single treadle-brake. Could not stop the train with the drum-brake; it seemed there was no power in it, and the engineer scolded me for letting the train pass the station, whereby the engineer had to reverse his engine and come back to the station; this occurred often while we were using that brake; several times I applied the brake so hard as to break the chains of the brake in trying to stop the
198 cars at the stations. The car Maryland was an old car, run behind on the train, and was left at Parkton station, about 30 miles from Baltimore, and then taken on again on our return-trip the same day and brought to Baltimore. At that time we ran the cars to Wrightsville, about 70 miles from Baltimore. I used always to brake on the hind car of the train to prevent the cars from running against each other.

The trains generally had two passenger-cars and one baggage-car between Baltimore and Parkton. I was the only brakeman employed on the train besides the baggage-master, who attended to his own brake. This car Maryland only ran once in a while, and that was when we were under the necessity of using it, and very often it was left at Bolton station on account of the brake being out of order, the chains being broke. The nearest, to my recollection, about two-thirds of the time this car Maryland was running. I mean two days out of three, and then it ran only thirty miles and back, while the train ran 70 miles and back. There was but one passenger-train a day at that time.

The engineer of this train was Albert Fisher. Albert Fisher and I made complaint to M'r Millholland and M'r Denmead, masters of machinery, that the brake worked bad; telling them about the chains breaking and so forth, and not being able to stop the train. The car Maryland was left in the shed awhile, and then taken to the carpenters' shop and rebuilt, and this drum-brake taken off, and the single treadle-brake put on in its place. I recollect distinctly that the drum-brake was not put on the car Maryland after she was rebuilt.

Cross-examined:

199 Q. Did this brake (the drum-brake) so combine the brakes of the two trucks with the drum and the windlasses of the car as to enable the brakesman to bring or force the brakes against their respective wheels, whether he was at the forward or rear end of the car?

A. Yes, sir.

Direct examination resumed:

I could not stop the train as well with the drum-brake as I could with the single treadle-brake. I could not near as well.

Cross-examination resumed:

Q. Could you slide the wheels with the drum-brake?

A. No, sir; I could with the single brake though.

JOHN YAKEL.

Sworn to and subscribed October 22d, 1852.

J. HANNAN,
U. S. Commissioner.

200 *Deposition of Ephraim Harris.*

I am forty-eight years and upwards; reside in the county of Montgomery, and State of Pennsylvania; I am a blacksmith by occupation.

Q. Were you ever engaged on the Western Railroad of Massachusetts? If so, when, and in what capacity?

A. I was engaged on said road from 1839 to 1852 as foreman of the blacksmith department.

(M'r Sayles offers in evidence model marked "Springfield brake, C. F. H.")

201 Q. Did you ever see a brake as represented by said model? If so, when and where?

A. I saw a brake as represented by said model in 1843 or 1844, at Springfield, Massachusetts.

Q. Was said brake in use on cars? If so, on what cars, for how long time, and how did it work? Explain fully.

A. Said brake was in use on cars for part of two years. It did not give full satisfaction in working. We had two long crate-cars running from Springfield to Albany. At Albany the road descended towards the river. This crate-car then had a single brake on it, and running down to the river to unload the cars the brakeman undertook to brake up the car, and the chain broke, and before he could get to the other end of the car to brake, the car ran into the river.

M'r Gray, then superintendent of the Western road, wanted I should put something on the car, an attachment put on the car, whereby the brakeman, if the chain broke, would have command of the other truck to brake it, and I arranged a car the same as this model, and on arranging it in this way we found considerable difficulty in winding the two chains on the windlass. They would override, and even so much as to destroy the power of the brake on the car entirely. The first lever from the windlass was something like fourteen (14) inches. Being that distance, if the chains were adjusted so as to brake both trucks at a time (I mean, to apply on a straight track), the short chain would prevent the car from turning on a curve. These chains had to be altered or lengthened to accommodate the curves of the road. The brakeman and conductor on the cars found considerable difficulty and fault in their operation.

202 The car had been thrown from the track in consequence of the short chain not allowing the truck to accommodate itself to the curves.

This brake, at the time it was put on, was not intended to brake both ends of the car at once. It was put on in case the short chain broke, that the brakeman might have the use of the other.

The crate-cars were switched from the main track, and were run down towards to river to unload their contents into the boat, and this attachment of the brake was put upon these cars to prevent them running into the river.

On the last car the brake was put on. The second car I put a swivel-joint on the long rods, for lengthening or shortening the same. That did not improve the brake at all.

These brakes were in use part of two summers. The cars were then thrown aside for a while, and then rebuilt.

The brakemen considered they could handle the car better with a single brake.

Cross-examined by S. M. Whipple:

Q. You say that the car had been thrown from the track in consequence of the short chain not accommodating itself to the curves. Which, in your judgment, would most likely take place under those circumstances, the breaking of the short chain connecting said lever to the windlass or the car leaving the track.

A. I should judge, in most cases, that the truck would be likely to leave the track rather than breaking the chain.

Q. Did it, under such circumstances, leave the track rather than break the chain?

A. It was so reported.

203 Q. You say the brakeman and conductor said they could handle the car better with the single brake. Did they not, on this brake, have all the advantages of a single brake? If not, why not?

A. They did not on this brake have all the advantages of a single brake. The windlass that takes the chain couldn't be but about a certain length from the platform down; consequently it gave a short distance for two chains, and this long chain being the upper chain and the lower chain having to be put so low on the windlass, many times the lower chain would toggle under the bottom of the windlass. Then, in other instances, the upper chain, having to have some considerable slack to accommodate the operation, at the first turn of the windlass the upper chain would ride down upon the lower chain—overlap on the lower chain.

Q. What is the diameter of the windlass-staff upon which the chain wound?

A. Inch and half round where the chains wound and an inch above.

Q. How many revolutions of the windlass were required for applying the brake?

A. That must depend upon the adjustment of the brakes to the wheels. You might calculate two or three or four, according to the adjustment of the brake.

Q. Was there any alterations or modifications of this brake after it was first put on.

A. The chains were altered in their length.

Q. Did it answer the purpose for which it was designed better than the single brake?

A. It never had a trial to prove.

Q. Did you not say it was used upon two crate-cars part of two seasons?

A. Yes; it was.

Q. Was not the single brake in use upon the cars before this brake was put on?

A. It was.

204 **Redirect:**

Q. When these cars were altered, what kind of brake was put upon them?

A. A single brake; this brake was abandoned, thrown out, and was never put on any other car while I was there.

Q. Did you put a brake on an engine-tender a short time before you put this brake on the crate-car that operated upon both trucks from one windlass?

A. I put on one, but I cannot say whether I put it on before or after I put it on the crate-car. It operated upon both truck'.

Q. Could that brake have been operated from either end?

A. It could not, as the arrangements then were.

Q. Would it have been a practical brake for a passenger-car?

A. Not any more so than this one.

Recross:

Q. You say that the brake which you put on the tender on the Western road operated on both trucks. How, then, do you say that it was not a better brake than the Springfield brake, which you say was only intended to operate *only* on one truck at a time?

A. It had the same disadvantages as the "Springfield brake," because both chains were wound on one windlass.

Q. Was not the brake afterward so altered as to dispense with one of the chains, by combining the lever nearest to the windlass with the rod connected to the lever in the other truck?

A. Not that I know of; not whilst I was there.

205 Q. Into what were the crate-cars altered after their disuse as crate-cars?

A. They were shortened, and made into house-cars—baggage-cars.

Q. What brakes were in general use on the Western road while you were in connection with it?

A. The common single brake.

EPHRAIM HARRIS.

Subscribed and sworn to Oct. 23d, 1862.

C. F. HEAZLITT,
U. S. Commissioner.

206 Depositions taken in Boston, Mass., Oct. 27th, 28th, 29th, and 30th, 1862, before E. Merwin, U. S. commissioner.

Present, Tho'as Sayles, plaintiff; S. M. Whipple, for defendant.

Deposition of Albert J. Bellows.

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Albert J. Bellows; age, fifty-eight years; residence, Roxbury, Massachusetts; and I am a practicing physician.

Int. 2. Are you acquainted with Asahel G. Bachelder and Lafayette F. Thompson? If yea, where did you first become acquainted with them?

A. I am. I was first acquainted with them in the last of the year 1846 or the first of 1847. I then resided in Charlestown, Mass., and M'r Thompson also resided there then. M'r Bachelder, I think, resided in Lowell. My first acquaintance with them began by M'r Thompson showing me the model of a double-acting brake, I think they called it.

(The plaintiff here introduced a model, which is marked "Bachelder Model, E. Merwin, U. S. C.," and the same is exhibited to the deponent, who resumes:)

I saw this model, or a model representing the same double-acting brake like this. I think this is the same model shown me by Thompson in the latter part of 1846 or first part of 1847. Some time after this I engaged to assist Bachelder and Thompson in making a practical application of this principle to a car on the Fitchburg road. I became interested in the invention, and applied, with Bachelder and Thompson and Nathaniel Heath, for a patent. Nathaniel Heath did all the business in regard to obtaining a patent. 207 I was to furnish the means of introducing it and also the expense of procuring the patent, I believe. I was to have one-quarter of the patent-right, if granted. Bachelder and Thompson, at that time, said they had no means, and were apparently poor. This brake was put on to the Fitchburg car under my own observation in the fall of 1847.

The model marked "Fitchburg Model, E. Merwin, U. S. C.," is hereby produced by the plaintiff and exhibited to the witness, who resumes:

This model seems to represent the principle of the brake as applied to the Fitchburg car under my observation, as I have stated. For a long time the issuing of the patent was delayed, and on frequent inquiry of Heath I was never able to get a satisfactory explanation of the reason. I occasionally contrived to make inquiries of him. We had not obtained a patent up to the time when Tanner appeared to me and said that he had himself been endeavoring to get a patent, and he found that we had a model and application for the same thing, and we then finally assigned to him; ours being prior to his, he wished to purchase it, and he did purchase it.

I had continued to make inquiries of Heath as to the delay in receiving the patent, up to the time of the sale to Tanner. I think the process was, that I assigned back to Bachelder and Thompson, and they assigned to Tanner. I know the purpose of my assigning was that it should go to Tanner.

Cross-examined by M'r Whipple for respondent:

208 Int. 1. In what way or by what means do you fix the time of your acquaintance with said Thompson and Bachelder?

A. I fix it by reference to a letter, which is not now present, written by myself to some gentlemen, I think, in Bangor, which was found in the Patent Office.

Int. 2. What was the date of that letter?

A. It was in the fall of 1847; I cannot state the month; I have not seen the letter for a year; the letter related to the application of the brake just then made on the Fitchburg Road.

Int. 3. How, then, does the writing of that letter, as you say, in the fall of 1847, enable you to determine that your first acquaintance with these parties was the year previous?

A. I remember that it was in the winter before the application of the brake that I made their acquaintance.

Int. 4. What month, should you judge, in what winter?

A. I have no means of stating more definitely than I have stated before.

Int. 5. What is there about this "Bachelder Model" that enables you, at this late date, to identify it as the one shown you, as you say, by said Bachelder and Thompson on your first acquaintance, in the winter of 1847?

A. I identify this arrangement of levers, by which both set of wheels are acted upon by one windlass.

Int. 6. Was there any bumper arrangement connected with this model?

209 A. I think there was; at any rate there was with the application of it to the cars.

Int. 7. Is there any connected with model?

A. There is not now; there is an indentation in the wood at both ends, indicating that it was arranged for it.

Int. 8. You say that you assisted Bachelder and Thompson in making an application of this principle to a car on the Fitchburg Road; what do you mean by principle? Please explain fully.

A. I mean that to which I have referred, by which one brakeman can apply the brakes to both set of wheels.

Int. 9. What was the primary object in view in constructing and applying this brake; to make a train brake or hand brake?

A. I don't know.

Int. 10. Speaking of the "Fitchburg Model" you say it seems to represent the principle as applied to a car under your observation; does it only seem to be the principle, or are you positive that it is the principle?

A. I am positive that it is a representation of the principle.

Int. 11. Were the models like either of these now filed in the case, filed in the Patent Office when application was made for a patent?

A. I was told there was, but do not know.

Int. 12. "CHARLESTOWN, MASS., *December* 9, 1847.

"To the Commissioner of Patents:

210 "Pleace stay any further proceedings in the case of the application of us for the patent of Thompson and Bachelder's improvement in the car-brake, as we wish to make some further improvements. The application was made by M'r N. Heath, and the model deposited by him June 26th, 1847, with H. H. Sylvester, esq.

"Your obedient servants,

"THOMPSON & BACHELDER.
"Per NATHANIEL HEATH."

Were you aware of the writing of a letter of which the above is a copy?
(Objected to by plaintiff as incompetent.)

A. I am unable to say.

Int. 13. Were there any improvements on the brake as represented in the models, after the application of the brake to the car on the Fitchburg Road?

A. There was no change of the principle; there may have been improvements in the application of it, but I don't know that there was.

Int. 14. "PATENT OFFICE, *October* 17, 1851.

"GENTLEMEN: Specifications and drawings of your alleged improvements in railroad-brakes are herewith returned for entire insufficiency. The office, from what I can learn of the case, cannot encourage you, however, to press the application farther. 211

"Respectfully, yours,

"THOMAS EWBANK,
"*Commissioner of Patents.*

"THOMPSON & BACHELDER, R. H. EDDY,
"*Boston, Mass.*"

Were you knowing to the receipt of such a letter by Thompson and Bachelder, or their agents, as is above copied?
(Objected to by plaintiff as incompetent.)

A. I remember nothing about it.

Int. 15. What consideration did you receive from Bachelder and Thompson for the assignment of your interest to them in said application for a patent on the brake in question?

A. I have not yet received the first cent for that or anything else I have done; I did have one obligation from Tanner, that I should receive a portion of the profits which he should obtain from it.

(Signed) ALBERT J. BELLOWS.

212 *Deposition of Albert Fisher.*

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Albert Fisher; age, fifty years; residence, Dedham, Mass., and I am a locomotive engineer.

Int. 2. Please state whether you were ever employed on the Baltimore and Susquehanna Railroad. If so, when, and in what capacity?

A. I was employed on that road from 1838 to 1848, as a locomotive engineer.

Int. 3. State whether or not, during the time you were so employed on that road, you knew of the trial of a brake called "drum-brake," about the year 1845. If so, state all you know in reference to the same.

A. I remember there was such a brake tried on the road. There was a drum under the centre of the car, rods leading from that to an upright shaft, and a crank on the upper end of it for a brakeman to work it by. It was tried on the road in the fore part of the summer or last part of the spring of 1845. It worked very badly. It was so constructed that there was very little power. There was no leverage or anything except the winding of the chain around the upright shaft. It was used on the train I run on as engineer. It was used occasionally, I should judge, for two months. I am not able to say positive about that. It was generally on the hind car of the train, and left at Parkton, about thirty miles from Baltimore, that being at the foot of the summit. It worked very badly when the brakes were set. The brakeman did not hold the train

213 up at the stations as good as a single treadle-brake. I often run by the stations and had to reverse my engine and run back to the station when this brake was applied. John Yakel was the brakeman when this brake was put on. I often used to find fault with him, and scold him for not holding me up at the stations. On examining the brake, I found it was not his fault. There was not the power in the brake to hold the train. I reported it to the master mechanic and his assistant. I complained to them, perhaps two or three times, about its not working well. I do not remember about the chain breaking. The brake was taken from the car and the old treadle-brake was put on.

The plaintiff here produces the model marked "Melholland Model," "J. H.," and exhibits it to the witness, who resumes:

That model represents the Melholland drum-brake, which was put on the car Maryland on the Baltimore and Susquehanna Road, about which I have already testified; the drum arrangement and the truck-levers, I recollect distinctly, were the same as are shown in this model; there was no leverage either to the drum or truck-levers; that was the reason it was taken off, because we couldn't use it to any advantage.

Cross-examined by Mr. Whipple for respondents:

Int. 1. Did the said Melholland drum-brake so combine the brakes of the two trucks with the drum and the windlasses of the car as to enable a brakeman to bring or force the brakes against their respective wheels whether he was at the forward or rear end of the car?

214 A. That was the intention of it when it was got up. I couldn't say that the brakes were applied to the wheels; I was not in a position where I could see.

Direct examination resumed:

1. Direct. Were you the only engineer on the passenger-train on said road?

A. I was the only regular passenger engineer. The treadle-brake was the one in general use all the time I was on that road; the single treadle-break, I should judge; as near as I can recollect, that the car Maryland was used about one-third of the time for the two months or so that the drum-brake was on that car; it was generally used when we wanted an extra car only; the reason why this car was left at Parkton was because we didn't consider this brake safe to go over the summit with; the grade there is eighty-four feet to the mile.

(Signed) ALBERT FISHER.

Deposition of Asahel G. Bachelder.

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Asahel G. Bachelder; age, forty-two years; residence, Lowell, Mass.; and I am a carriage-maker.

Int. 2. Are you acquainted with Lafayette F. Thompson, formerly of Charlestown, Mass.; if so, when did you become acquainted with him?

215 I am acquainted with him; I became acquainted with him in the spring of 1846. I understand that he is now in Minnesota in the United States Army.

Int. 3. Did he ever live with you; and, if so, when, and where?

A. He lived with me in the fall of 1846, at Lowell; he came to live with me about the first days of October.

Int. 4. State whether or not Thompson and yourself were engaged together, at any time, in getting up a double-acting brake for railroad-cars; if yea, state the commencement and progress of the invention in regard to consultations, if any, between you and him, and drawings, models, applying for patent, trying the brake on railroads, and any other details that occur to you in connection with the progress of the invention, as nearly in order of time as you can give them.

A. We were engaged together in getting up a brake. My attention was first called to it by a small model he showed me; that was some time before he came to live with me; then we were engaged in making drawings of car-brakes different from the one he showed me; we were engaged evenings making drawings and drew out several plans. We made a plan, which we afterwards made a model of, about the time he came to live with me, soon after, a few days. I commenced on the model soon after that and finished it in the course of the winter; I can't state the exact time I finished it; it might be January, it might be the first of February; the model here present marked "Bacheider Model; E. Merwin, U. S. C.," is the original model made by me—that is, the framework, and the brake was arranged as it now is. All that is on it

216 now was on it when I first made it; but there was also a bumper arrangement put on it at the same time which was not now on the model; the model was made from the drawings made by Thompson and myself, in October, 1846.

I made another model for the Patent Office in March or April of 1847; I carried it to Boston and left it with M'r Nathaniel Heath; we employed him as our agent to take out the patent; he was to become interested in the patent. We applied for a patent somewhere about the middle of June, 1847; I don't remember the day; we tried the brake on one car on the Fitchburg road in the same fall, in October, 1847; after we got it arranged we made one trial trip with it; I went with it; it worked to our entire satisfaction. The next summer I put it on a car at Lowell, on the Lowell Road. I only put on the hand-braking on the Lowell road; on reflection I am satisfied I put it on the same as on the Fitchburg car.

The model marked "Fitchburg Model" is here exhibited to the witness, and he is asked by plaintiff what it represents, if anything, and resumes:

This model represents the precise arrangement as it was put on the Fitchburg car. We, that is, D'r Bellows and myself, were at the expense of making these experiments, except that the two railroads furnished the irons and forged them. I think the brake remained on the Fitchburg car from October to the next spring some time. Thompson wrote me that he had ordered it off, and I presume it was taken off.

The plaintiff here produces, and exhibits to the witness, the model marked "B. and T.'s P. O. Model, E. M.," and witness resumes:

217 This model is like the one we sent to the Patent Office; I mean like the one which I made in March or April, 1847, and carried to M'r Heath. We put on these large rods so as to brake up the rear end of the rear car on the train, while with the small rods, like those in the Fitchburg model, it would not break the rear end of the rear car from the bumper; the object was to break up both ends of the car from either end of the car by the bumpers or by the windlass.

Our idea was that when the cars were detached from the engine, by checking the forward car by the windlass, the pressure of the other cars against that one and against each other would brake themselves by means of the bumpers; that would be the operation whether the engine was detached or not, so long as the first car was checked. Soon after the experiment on the Fitchburg Road we wrote to M'r Heath to stay proceedings. We thought we ought to make some alterations in the model we sent to the Patent Office.

Finally, we concluded that the model which we had already sent to Washington covered all the ground which we wished to claim; that is, we wished to claim what is represented in the Fitchburg model. By that we did away with the long rod in the Patent-Office model. D'r Bellows and M'r Heath both understood that the Patent-Office model covered all that was in the Fitchburg model. We had no idea of making an improvement in the brake; we calculated it was all the same. What we wanted was to alter the model—why we stayed proceedings.

It might have been a month before we decided not to alter the model. When the Patent-Office model was made the back end of the notch or gaine in the draw-bar was rounded or slanted so as to let the brake-
lever play out easily when you applied the windlass. There was
218 no improvement made or attempted in the hand-braking arrange-
ment after the first drawings, in October, 1846.

M'r Thompson and myself had no experience at all in applying for patents at the time this one was applied for. This application for a patent was assigned, by M'r Thompson and myself, to Henry Tanner, of Buffalo, N. Y., in the spring of 1852.

I saw this double brake, like the one in the "Bachelder Model," on two roads, at least, I recollect now, in the year 1850. I think I saw it on the Nashua and Worcester Road and on the Northern New Hampshire Road. I happened to be at the depot and saw it, and told the brakeman and conductor that was my invention, and they had no right to use it, and that I had applied for a patent for it. This conversation was on the Northern Road. On the Nashua and Worcester Road I only saw it on the cars as I passed from Lowell up.

M'r Heath carried the model and the papers to the Patent Office at Washington, and told us, when he came back, that the patent would probably be out in six months. After the six months we frequently called on him in order to find out the cause of the delay. He always replied by saying that he had written to the office, and also said that he had been there himself after he had carried the model there. We continued to call upon him all the time until it was put into M'r Eddy's hands to manage.

After we found that there was no prospect of Heath doing anything we compelled him to put it into M'r Eddy's hands. He wouldn't consent to put it into M'r Eddy's hands no farther than M'r Eddy should write to the Patent Office to find out about how it stood. He said he
didn't like M'r Eddy, and wouldn't have any more to do with him
219 than he could help. M'r Heath consented to the employment of
M'r Eddy to write to the Patent Office, and M'r Eddy did write
about the 1st of October, 1850. Heath refused to employ M'r Eddy any farther. We always insisted that he should employ Eddy, but he wanted to employ some other patent agent here, whose name I do not recollect. M'r Heath and myself went and saw this other man, and I told M'r Heath that I had rather M'r Eddy should manage the affair. M'r Thompson and I had talked with M'r Eddy about it several times, and thought he understood the matter fully. We threatened M'r Heath pretty hard to take the whole business out of his hands, as he had agreed to take out the patent at his own expense for his share in it, which was one-third, and he finally consented to employ M'r Eddy. It was some time before he consented. I do not remember precisely how long. I couldn't say when M'r Eddy was finally employed to attend to the mat-

ter. It was a number of months after we employed him at first to write the letter to Washington—the letter of October, 1850.

M'r Heath told me, as one reason why he did not wish to employ him, was that he thought his charges were too high. That he charged him three dollars for writing one letter to Washington, and he wanted thirty dollars to do the business to take out the patent there, and M'r Heath objected to paying out anything further, as he had already been to the expense of applying for the patent. Thompson and I had not the money do it ourselves. Heath finally consented to employ Eddy, and employed him some. I do not know how much. D'r Bellows became interested in the brake. M'r Heath took him in by some arrangement between them two, that he was to be at some of the expense, I think,
of trying the brake on roads. After D'r Bellows was taken in,
220 Heath came and got our consent to admit D'r Bellows by his being
at the expense of trying it on the roads, and we four then were
to share equally in the proceeds of the patent, if granted.

Cross-examined by M'r Whipple, for respondents:

Int. 1. You being a carriage-maker, what circumstance or circumstances led you to get up a railroad-car brake?

A. It was by M'r Thompson showing me a little model of a car-brake that he had. It was a little small thing, about as big as your hand, the whole thing. It was arranged with elbow-joint levers, four of them, I think. He thought he could get a great power out of them by applying the brakes by a bumper arrangement. He wanted me to make a large model of it in order to see if it could not be applied to railroad cars, and I made one.

I found that it could not be applied to a railroad car. By my making that mdoel it set my mind on car-brakes. It was not in our mind to prevent collisions in making the brake in the first place, but we calculated that the brake, by means of the bumpers, would prevent collisions.

Int. 2. Which idea was first and foremost in your mind in getting up said brake; a bumper-brake or a hand-brake?

A. It was got up together, a bumper and the hand part. After making this model of M'r Thompson's, we went to work and made drawings of a brake with the bumper and hand-brake both together. It was our intention that they should operate separately. I placed most value on
the hand arrangement.

221 Int. 3. Does your specification and model, filed in the Patent
Office in June, 1847, convey the idea that you placed most value
on the hand-brake?

A. I could not say whether it did or did not; it is a good many years since I saw them.

Int. 4. Did you preserve the drawing from which you say the Batchelder model was made?

A. I can't say as to that; I do not know how long it was preserved. It might have been a few months; I recollect carrying it in my pocket some time.

Int. 5. Did these improvements or alterations for which you ordered proceedings stayed at the Patent Office, grow out of your experiments with brake on the Fitchburg Road?

A. As far as the bumper arrangement, it did.

Int. 6. Please explain what you mean by the bumper arrangement as connected with the other parts, and what became of it after your experiments on the Fitchburg Road.

A. I considered there were two parts to the break, a bumper arrangement and a hand arrangement, which operated independently of each other; there was nothing done with the bumper arrangement after the experiments on the Fitchburg Road, except that the same bumper arrangement was tried on the Lowell Road; there was no alteration in the arrangement after the trial on the Fitchburg Road.

Int. 7. Was a brake like the "B. and T's P. O. Model, E. M.," ever applied to a car?

A. There never was any application of it.

222 Int. 8. Did you, at the time of sending the said "B. and T. P. O. Model" to the Patent Office, have in your possession the Bachelder Model?

A. I could not say whether I had it or whether it was in Boston, but it was at my disposal.

Int. 9. You say, in your direct examination, that "Finally we concluded that the model which we had already sent to Washington covered all the ground which we wished to claim; that is, we wished to claim what is represented in the Fitchburg Model;" was it this particular kind of brake that you wished to claim; if so, what was your claim?

A. Of course it was; we claimed the brakeing by hand, and also by bumpers; we had it in both models.

Int. 10. Was there any such claim in your application for a patent?

A. I suppose there was; there should have been.

Int. 11. Did M'r Eddy obtain from the Patent Office the papers connected with your application after he took charge of the case?

A. I believe he did.

Int. 12. After reviewing the case did he return the papers to the office and request an examination?

A. I believe he did; what I knew about the papers was what was written to me at Lowell by Heath or Bellows, I could not say which.

Int. 13. The papers having been revised by M'r Eddy and returned to the office, and an examination of them had, did you receive the following official letter, to wit:

223 PATENT OFFICE, *October* 17, 1851.

GENTLEMEN:

Specifications and drawings of your alleged improvement in railroad brakes are herewith returned for entire insufficiency. The office, from what I can learn of the case, cannot encourage you, however, to press the application farther.

Respectfully, yours,

THOMAS EWBANK,
Commissioner of Patents.

THOMPSON & BACHELDER, R. H. EDDY,
Boston, Mass.

(The plaintiff objects to the question, because it assumes that M'r Eddy had revised the papers, and also generally.)

A. I never had any knowledge of their being received at that time. After the papers were sent to the office by M'r Eddy I did not receive the official letter.

Int. 14. Did you receive the knowledge of its contents?

A. I might, part of it—not just as stated there.

Int. 15. What part did you receive knowledge of?

A. M'r Heath or D'r Bellows wrote me that Eddy had received a letter from the Patent Office saying our claim was too broad; that it cov-

ered any kind of a car-brake—something to that amount; and
224 that they, the Patent Office, did not advise us to press the matter. I think that is the substance of the letter I received.

Int. 16. Did you conclude to conform to the advice in said Patent-Office letter?

A. I did not.

Int. 17. When Henry Tanner came to you to purchase said application, what were your feelings in the matter, and how did you express yourself to him?

A. My feelings were that if we had employed M'r Eddy in the first place, independently of Heath, we should have had the patent long before then. I cannot say how I expressed myself to M'r Tanner, unless it was by repeating these words to him. I always supposed we were entitled to a patent, and that it could have been obtained, and could then.

Int. 18. What consideration did M'r Tanner offer for your application, and what consideration did you accept?

A. He offered to pay us one-half he collected after deducting twenty-five per cent. from the whole sum collected for collecting, and we accepted that offer; for all expenses of lawsuits, also, he was to be reimbursed from the general fund.

Int. 19. Was that agreement carried out?

A. Tanner never paid a dollar on that agreement.

Int. 20. In applying your brake to a car on the Fitchburg Road how did you prevent the levers, in each truck, from dropping upon the track when not in use, as the model shows that they were not sustained by any connection with the truck except with the brake-bars of the truck?

225 A. I think the severel rods held them up.

Int. 21. Was that all that held them up—the connecting-rods?

A. The tops ran up through a slot cut in the elbow-lever to throw it out of gear. I think the hand-brake rod was applied above that slot through this lever.

Int. 22. Was the levers in the trucks of the car to which you applied your arrangement the same in their relation to the several parts as shown in the "Fitchburg Model?"

A. We used the old levers, as we found them on the car, without alteration.

Int. 23. Did you alter the connecting-rods?

A. I think we did.

Int. 24. Were the levers, as you found them, suspended in the centre of the truck, as seen in the model, or were they attached to the one or the other of the brake-bars either by the fulcrum or the short arm?

A. They were not suspended in the centre; they were hung near the brake beam.

Int. 25. What was the length of the slot in the draw-bar which encircled the king bolts?

A. I think it was eight inches.

Int. 26. What was the diameter of the king-bolt?

A. It was an inch and three-quarters, or two inches.

Int. 27. Could you apply the brakes effectually and efficiently on six inches of motion in the draw-bar?

A. We did.

226 Int. 28. To both trucks of the car?

A. To both trucks.

Int. 29. At the same time?

A. At the same time; not on both ends of the car; each bumper applied it to each end of the car; each bumper to its own end.

Int. 30. Did the Fitchburg and Lowell Railroad Companies, after a trial of your brake, think enough of it to desire its use upon their cars?

A. I think the Lowell Railroad would have adopted it if they had not bought Hodge's patent unbeknown to M'r King, their superintendent of machinery; it was running on the road at the time Hodge's was ordered to be put on.

Direct examination resumed:

1. Direct resumed. You stated that M'r Tanner had never paid you a dollar on his contract; what reason did he assign for not paying you anything, if any?

A. The reason that he gave me that he had not collected anything of any amount, not as much as he expended in law matters; that was a year, or about a year, after he bought it of us. M'r Thompson made a subsequent arrangement with him. I cannot say whether it was one or two years after Tanner purchased of us; this arrangement was made unknown to me. By the last arrangement M'r Tanner bought of M'r Thompson the whole right to the patent, and gave him a bond for two thousand dollars, I believe, and some stock in a car seat manufacturing company in New York.

227 Examination here is adjourned, by consent, to Tuesday, Oct. 28th.

Oct. 28th, examination resumed.

2. Direct. You stated in your answer to the first cross-interrogatory, "It was not in our minds to prevent collisions in making the brake in the first place, but we calculated that the brake, by means of the bumpers, would prevent collisions"; did you mean it would prevent collisions independent of the hand-brake? Please explain fully.

A. It might; but I always supposed, from the first, that the bumper part of the brake was not of much account independent of the hand-brake.

(Respondents here object to the witness reading from manuscript previously prepared.)

My idea was to patent the hand-brake together with the bumper arrangement, but I was always in favor of having the hand part fastened separate from the bumper arrangement, as shown in the old Bachelder model. M'r Thompson insisted on having both parts fastened together; so did M'r Heath, and I finally consented to that arrangement, and then made the model for the Patent Office. I supposed, when we employed M'r Heath to obtain the patent, that he would employ men that understood the business by describing our invention and fixing the claim as it should be; by that reason I had little to say. I trusted to him without paying much attention to it myself. I knew nothing about the mode of applying for patents, as I had never looked over patent papers before in my life.

228 We finally concluded to patent the bumper arrangement with the hand arrangement. We intended to patent the arrangement to operate the brakes by hand from either end of the car, together with the bumper arrangement, which operated independently of the hand-brake from either end of the car. I have not read any of the answer from manuscript since the objection to my doing so was entered.

Cross examination resumed:

Int. 31. Have not your answers to questions put by plaintiff been foreshadowed to you in the questions themselves?

A. Some of them might have been.

Int. 32. Was not your last answer nearly in the words of the question? I refer to the question embodied in the last sentence but one of your last direct answer?

A. I don't think it was.

Int. 33. How, then, did you arrive at a correct answer to the question, if it was not as you say?

A. By my knowledge of the affair of the brake from beginning to end.

Int. 34. Did you explain to M'r Heath, who had charge of your application for a patent, your brake in all its details, and what you claimed as your invention for which you desired letters patent?

A. We did.

Int. 35. Did he embody that explanation and claim in said specification?

A. I cannot say whether he did or did not.

229 Int. 36. Did he send said specification and model of June, 1847, to Washington without consulting you after such explanation?

A. I had to sign the application, of course; that is all that I had to do about it.

Int. 37. Did you sign said specification without having it read to you before signing it?

A. I did, because I read it myself.

Int. 38. Then were you not aware of all its contents, and that the hand arrangement, or the operation of it, was merely incidental—entirely subservient to the bumper arrangement, and that there was no claim in said specification?

A. I merely looked it over hurriedly; I had the papers in my possession only a few moments; they were sent to me from Boston, by express, for me to return them by the next express. I was not aware of all its contents. I never had any such idea from the application that the hand arrangement was merely incidental. I was not aware that there was no claim in the specification, and am not aware of it now.

Int. 39. Do you consider yourself capable of understanding an instrument in writing, the contents of which you are directly, personally, and pecuniarily interested in?

A. I should if I took time to investigate it.

Int. 40. Were you not sufficiently interested in this specification to investigate and understand its contents?

A. I was enough interested in it. I left that matter to others who understood it better than I did, or should have done.

230 Int. 41. When the matter came into M'r Eddy's hands, as the agent of M'r Heath, who (Eddy), you say, was, in your estimation, competent, and to whom the papers were sent from Washington, did he review these papers?

A. I can't say whether he reviewed them, or what he done with them.

Int. 42. Did you not receive the knowledge of the contents of a letter, sent to you from the Patent Office, or to your agent, M'r Eddy, after an examination of your application, stating that it was entirely insufficient, and from what the office knew of the case could not encourage you to press your claim further?

A. I received a letter from M'r Heath, as I stated yesterday, from M'r Heath or D'r Bellows.

Int. 43. Did you or M'r Thompson have any practical knowledge of railroad machinery, or the operation of the same, when you set yourselves at work to get up a railroad-car brake?

A. I believe not.

Int. 44. How, then, did you arrive at all the details of a car-brake, as you say you did, in the first drawings which you made in October, 1856?

A. We did it by examining an old car-brake, and by understanding machinery.

Int. 45. What machinery?

A. My business had led me to almost all kinds of machinery in my life-time.

Int. 46. Please specify.

A. I being a mechanic from boyhood I always worked on ma-
231 chinery more or less; that is, had to do with it in shops where I
worked; I could generally make any kind of machinery that I set
myself about.

Int. 47. Defendant's counsel now presents to the witness the "Bachelder Model" and the "B. and T. P. O." model, and asks: Please state the similarity of the frame-work of the one to the other, without any reference to the brake-machinery on either.

A. One appears to be made in a hurry; the other appears to be got up more nicely, and more time spent upon it.

Int. 48. Are they alike in all the essential particulars?

A. I do not see anything essentially different.

Int. 49. Which was made first in the order of time?

A. The big one—the "Bachelder Model."

Int. 50. Was the brake now on the Bachelder Model applied to it at the time of making the same?

A. It was.

Int. 51. Has it been continued on this model from that time to the present?

A. There were stiff rods put into it, as represented in the Patent-Office Model; they remained on awhile.

Int. 52. Was the long rod, which you call H in your specification, also put on in connection with the large rods?

A. It was.

232 Int. 53. When did you put such a brake upon the Bachelder
Model as is seen in the B. and T. P. O. Model?

A. The long rod was put on when the model was first made; then I put on those stiff rods, as represented in "B. and T. P. O. Model," after trying those small rods, as represented in the Bachelder Model—soon after, it might have been a few weeks, it might not have been so long—I worked at the model a few hours at a time.

Int. 54. When did you take off from the Bachelder Model the brake which is on the Patent-Office Model and restore the one which is now on the Bachelder Model?

A. In 1847, the fall—I think October.

Int. 55. Do you, as a mechanic, consider the brake, as seen in the Patent-Office Model, practical in its operation either as a bumper-brake or hand-brake?

A. In the hand-brake, I do.

Int. 56. What is the length of a passenger-car from bolster to bolster?

A. About forty feet, as near as I can recollect.

Int. 57. What, then, would be the length, and size also, of those large thrust-rods applied to such a car?

A. They would be twenty feet certain, and size probably one inch.

Int. 58. Would they not easily bend, if made of that size, when the whole force of the brakeman is applied to them through the windlass?

A. They would if they were not stayed in two or three places, or supported by something.

233 Int. 59. If the spring, made to fit into a yoke in the large rod H, of Patent Office Model, was made stiff enough to keep the levers in the trucks in the gains of the draw-bar so as to make it effectual as a bumper-brake, would it not be difficult to draw them, the levers, out of the gain when used as a hand-brake?

A. I don't think it would; it don't require a very stiff spring to hold up the upright lever in the spring.

Int. 60. How do you know, as you say you never applied the brake in the Patent-Office Model to a car, and that you have had no experience in the practical operation of railroad machinery?

A. I know by its principles and its operation in the model.

Int. 61. Why, then, did you substitute an entirely different brake arrangement in prosecuting your case, at the Patent Office, and cause the Patent-Office Model to be cancelled, if it was a practical operative brake?

A. We considered this brake much easier, cheaper, and could be easier applied to a car; I mean by "this brake" the Bachelder Model brake.

Int. 62. You said, in your direct examination yesterday, that in the year 1850 you saw a brake in use upon the Northern road of New Hampshire like the one on the Bachelder Model, and that you claimed it as your invention; are you aware of the fact that a brake with a centre lever connected with the brakes of the car and the windlasses of the same by four rods all tensil-strained when used, was invented and in use upon a car upon the New Haven, Hartford and Springfield Rail-
234 road months before you applied for a patent on a brake as represented in your Patent-Office Model, and that this was well known to Henry Tanner, your assignee, that this brake was invented and applied by one Willard I. Nichols, and that, in view of your pecuniary interest, and the interest of your assignee, and other parties connected with you, that it became obligatory upon you, in the furtherance of your interest, to antedate the Nichols brake, as then understood, a brief period; and to this end the Nichols brake was, through pretence, substituted for your brake already in the Patent Office, and that thereafter the Nichols brake, and not your brake, was, by Henry Tanner, filed in the Patent Office, and the model which you put in cancelled?

A. I am not aware of any such brake as inquired of, though I have heard something about some kind of a brake; I could not tell what it represented. I don't know what Tanner knows concerning the brake. I did not know anything about the Nichols brake. I did not know anything about substituting the Nichols brake for our model at that time, and I don't know the fact, and never understood it so, that the Nichols brake was filed by Tanner in the Patent Office, and ours was cancelled at that time.

Int. 63. Have you been made aware of the fact since?

A. I think you told me something about it the other day.

Int. 64. Were you made acquainted with the fact, at any time, by Henry Tanner, or his associates, that your and their interests depended upon your fixing a date of a certain drawing, complete in all its parts, of a brake unlike the one you sent to the Patent Office, and that date was October, 1846?

235 A. We fixed them dates as they actually took place, I think; I was not acquainted as inquired of in the question.

Int. 65. Do you pretend to say that there was any other brake, well defined in your mind, than the one represented in the Patent-Office Model, at the time of making the same and sending it to the Patent-Office?

A. I do say that the one represented in the Bachelder Model was.

Int. 66. Who was the master-mechanic of the Fitchburg road when you applied your brake to a car on that road?

A. I think his name was Turner.

Int. 67. Was he favorable to your brake and to the 'pllication of it to a car on said road?

A. He never expressed any objection to the brake, but he seemed to object or dislike to have his car meddled with; he acted in that way.

Int. 68. Did he give you any assistance or any sympathy in applying it to a car on that road?

A. Not himself; his men did that worked for him.

Int. 69. Did you show him a model of your brake before the application; and, if so, what model?

A. We did; we showed him the Bachelder Model, which was then arranged like the Patent-Office Model.

Int. 70. And was it applied to a car upon that road?

A. We applied a brake to a car as represented in the Fitchburg Model.

236 Int. 71. How does it happen that you should show one model as a sample of what you wished to apply to a car and go on and apply an entirely different one?

A. I considered the different one essentially the same in operation.

Int. 72. You stated, in your examination yesterday, that M'r Turner objected to your cutting the car when you wished to make some alteration to accom'odate a rod. In which part of the trucks or car did you wish to do this cutting, and for what purpose? Please explain.

A. I wanted to cut a little out of the centre beam in the truck-frame for the long rod, that being dropped lower than the frame.

Int. 73. You said, yesterday, that you put the brake upon the Fitchburg car precisely as seen in the Fitchburg Model; is there any rod H in that model?

A. In my former answer, in cutting for this long rod, or the rod H, I then was at work putting it on the Fitchburg car, but did not put it on. I abandoned that rod, and then went to work and put it on as in the Fitchburg Model, for the reason that M'r Turner objected to any cutting on the cars. I put it on as in the Fitchburg Model.

Int. 74. This objection, then, was the cause, was it, of an entire revolution in your mind as to how you would finally apply the brake?

A. It was the cause of my abandoning the rod H, and substituting the elbow levers in its place, which were for the purpose of throwing the bumper arrangement out of gear.

Int. 75. Was that all the change you made, merely dispensing with that rod H?

237 A. The change was like the Fitchburg model.

Int. 76. Please specify the changes.

A. We set the brake-lever back of the truck-beam so that the back end of the draw-bar struck the brake-lever when forced in or back instead of its playing in the gain, as in the Patent Office Model; we used those elbow-levers to throw it out of gear when we wished to back the train, which was done by hand by means of side-levers on each end of the car, and we substituted four small rods instead of two large rods.

Int. 77. And did this take place in the fall of 1847?

A. It took place about the 20th of October, 1847.

Int. 78. Do you know Godfrey B. King, formerly master mechanic of the Lowell road; and was it under him that you applied your brake to a car on the Lowell road?

A. I do know him, and it was under him that we applied our brake on the Lowell road.

Int. 79. Has his deposition been taken, to your knowledge, in relation to the application of said brake to a car on the Lowell road?

A. It has.

Int. 80. Where and in what case?

A. It was taken in Boston and in Philadelphia, I believe, in the case of M'r Sayles against the Philadelphia and Baltimore road, I believe.

Int. 81. Did he state, in that deposition, that your brake was applied to a car on the Lowell road; was put on with large rods, as seen in the Patent Office Model?

Objected to by plaintiff.

A. I believe he did.

238 Int. 82. Have you been examined before in any case involving
the brakes at issue; and, if so, when and where?

A. I have been, in Albany, N. Y., in 1854; the next time was in Albany in 1855, I think, but am not sure; next time was in New York, two years ago, and soon after in this office, in the case of M'r Sayles against the Philadelphia and Baltimore road; I don't recollect of any other times now.

Int. 83. In what year and in what case were you first examined?

A. In 1854 or 1855, in the case of Henry Tanner against the New York and Erie road, I think.

Int. 84. Were you pecuniarily interested in the issues of that suit?

A. I was somewhat interested in it.

Int. 85. To what extent?

A. I don't know as I can state without going into the history of the case. M'r Thompson had a bond from Tanner which M'r Tanner agreed to pay in case he made anything out of the brake.

Int. 86. Were you made to understand by Henry Tanner and his associates, in preparing the evidence to be used in the trial of the said New York and Erie case, that certain facts and dates were to be established and sworn to positively and decidedly, in order to secure a successful issue of that suit for plaintiff?

A. They gave us to understand that we must fix the date as early as we could.

Int. 87. Were you made to understand that the date of said drawing,
referred to by you as being made by you in October, 1846, must
239 not be a month or six weeks later in date, and that the brake
must be complete, in all its parts, as seen in the Bachelder Model,
or that your evidence would be of little use to the plaintiff?

A. I have no recollection of any such thing.

Int. 88. Has not much of the evidence that you have given, at various times and places, involving railroad-car brakes, been framed for you and you becoming the mere expression of what the plaintiffs wanted from time to time?

A. I think I am capable of acting and speaking and thinking for myself.

Int. 89. Did you not, in your examination yesterday, state that your brake was put upon the Lowell road without the bumper arrangement, and on being prompted by plaintiff, said that it was put on; and has not the plaintiff, during your examination in the case, stopped the examination and whispered into your ear what he wanted you to testify to; and was not this whispering going on between you, and interrupted by the counsel for the defendant, towards the close of yesterday's examination, whereupon the plaintiff called for an adjournment?

A. I did so state; I should have made the alteration without any prompting from the plaintiff, because I understood the whole thing better than he did; I don't think he has stopped the examination and whispered in my ear what he wanted me to testify; plaintiff did whisper to me about when I wanted to return to Lowell just as the examination concluded yesterday; the plaintiff did not call for an adjournment; the commissioner did, if I recollect right.

240 Int. 90. Did the plaintiff prompt your answer to the last member of the foregoing question, and was your answer in accordance with his statement?

A. He did, and the answer was according to his statement, and as I understood it at the time.

Int. 91. Was the mere circumstance of your returning to Lowell, in your judgment, of sufficient importance and of so secret a nature as to justify plaintiff in stopping the proceedings and whispering to you on that very important subject, having no other end in view?

A. My returning to Lowell was not of much importance; I don't recollect as he did stop the proceedings.

Int. 92. Could he have whispered to you and not have stopped the proceedings?

A. I could not say as to that; I presume he might.

Direct examination resumed:

3d direct int. resumed. You stated in your cross-examination that you were somewhat interested in the decision of the New York and Erie suit; you spoke of M'r Thompson having a bond from Tanner; had or had not that bond been paid or cancelled before that suit was decided and you and Thompson received your pay?

A. It was cancelled or paid; we had received our pay in notes and money before the decision in that suit.

4 direct resumed. Was you, then, pecuniarily interested in the decision?

A. I was not.

241 Cross-examination resumed:

Int. 93. Was the bond, just alluded to, outstanding and unpaid when the evidence in said Erie case was prepared and put in?

A. I believe it was.

A. G. BACHELDER.

Deposition of Samuel Cooper.

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Samuel Cooper; age, forty-six years; residence, West Roxbury, Mass., and I am a civil engineer.

Int. 2. Please state what opportunities you have had for becoming acquainted with mechanical science, inventions, theoretical or practical, and to what extent have you been connected with patents for inventions, whether as an examiner in the Patent Office, or solicitor for patents, or an expert, and particularly with reference to inventions concerning railroad-cars.

A. From 1842 to 1848, I was in the employ of the Engineer Department of the United States Army; whilst so employed, I had charge of various public works, constructions of Fort Washington, on the Potomac, Fort Madison, at Annapolis, and several triangulations and surveys. In 1848 I went into the Patent Office as assistant examiner of patents; 242 whilst so employed I made the preliminary examination of all applications for patents connected with railroad-cars, brakes, and so forth.

After I became chief examiner these classes were also in my charge, and it was upon my report that applications for patents were passed or rejected; since the latter part of 1852 I have been engaged in Boston, preparing applications for patents. I am frequently called to testify in patent suits in the United States courts of this and other districts.

Int. 3. State whether, as such examiner in the Patent Office, you were familiar with the papers, drawings, and models put in on the application of Thompson and Bachelder for a patent for an improvement in railroad-car brakes in June, 1847, and with the other papers and proceedings on that application which resulted in the issuing of letters patent to Henry Tanner, as assignee of said Thompson and Bachelder, on the 6th day of July, 1852, and what, if anything, you had to do as such examiner with such application or patent.

A. I have no means of verifying the date which you give; my attention was first called to the Thompson and Bachelder application by an application for the reissue of C. B. Turner's patent for a car-brake. I then learned that there was a car-brake previously invented which, from the meagre description I had of it in a letter, appeared to be similar to the C. B. Turner brake; it afterwards appeared that there was an application for a patent for this same brake which was mentioned in the letter to which I refer. I subsequently found that this application was one upon which the draftsman of the Patent Office had some time before consulted me regarding one or more letters received from a man named Heath or Keith; subsequently the Thompson and Bachelder 243 application was prosecuted, and a patent was granted to Henry Tanner as assignee; as chief examiner I made all the examinations, conducted the correspondence, if there was any, and it was upon my report that the patent was granted.

It was the custom of the examiners, in any case out of the common way, to consult with the other examiners, and I remember consulting with my colleagues in this matter.

Int. 4. Are you familiar with such patent as issued?

A. I believe I am.

Int. 5. Please state what you understand to be the mode of operation, construction, and essence of the invention set forth in the said Tanner patent.

A. The invention consists in a mechanism by which all the brakes of each truck may be applied from either end of the car by connecting the brake apparatus of the two trucks together by means of a vibrating lever in the centre of the car; the other levers and connections being so hung and arranged that the apparatus in each truck should be self-adjusting, and the parts so proportioned that one man at either end of the car could exert the requisite force to apply all the brakes.

Int. 6. Please state whether or not the invention, set forth in the Tanner patent, is embodied in the specification, drawings, and model filed in the Patent Office in June, 1847, by Bachelder and Thompson, with

Int. 11. Please state whether, in your opinion, the brake shown on the Springfield model involves the same or a different principle from that shown in the Tanner parent; please explain fully.

A. By no means the same principle, for this reason: the power in the Tanner patent is first transmitted to a central lever, from which it is transmitted equally to the two trucks; in the Springfield model the power is transmitted directly from the windlass to the brakes of each truck, and there is only one possible position of the trucks which will enable the windlass to apply an equal force to the brakes of each truck; in all other positions in which the trucks may be all the power applied will be transmitted to one truck only, the position of the trucks, of course, being determined by the nature of the tracks, whether curved or straight.

Int. 12. Please answer the same question as to the said Springfield model and the original application of Bachelder and Thompson.

A. I make the same reply to this interrogatory, for I now see no difference of principle in the original application and the patent that was granted upon it.

Int. 13. If the brake shown in said Springfield model had been brought
to the knowledge of the Patent Office examiner at the time of his
249 examination of the Bachelder and Thompson took place, what
effect, if any, would that have had upon the issuing of letters
patent upon said latter application?

A. None whatever, if I had been the examiner; the two things, in my opinion, had nothing to do with each other; in the one case the brakes of each truck can be applied from either end of the car; in the other they cannot.

Int. 14. Please state whether or not you find the points of difficulty which you see in the Milholland model either in the Tanner brake as patented, or in the original application of Bachelder and Thompson made in 1847?

A. In neither case are there the same difficulties; the brake-levers in both the Tanner patent and the original application being suspended and without rigid fulcrums, thereby giving to the brakes of each truck a self-adjustability which is entirely wanting in the Milholland brake.

Cross-examined by M'r Whipple, for respondents:

Int. 1. Have you had any experience in the practical operation of railroad-machinery? If so, please state to what extent.

A. My experience has been this. I have been examined as an expert in the last ten years, upon a great variety of railroad subjects, and on such occasions I have ridden a great deal and been constantly with railroad-men, sometimes for a month and six weeks together; during that
ten years I have ridden nearly every day upon some railroad, and
250 as an engineer have naturally observed whatever came before me
in my profession.

Previous to that, as I have before stated, for between four and five years matters of this description came before me in the Patent Office, and I have procured a great many patents for railroad inventions, including car-brakes; I never made a car-brake, and I never worked one as a brakeman, but I have made it my business, so far as all the means within my reach would permit me to do, to understand their nature and their exigencies.

Int. 2. Have you had any practical experience in applying car-brake machinery to railroad-cars?

A. If by applying car-brake machinery to railroad-cars you mean operating the brakes as a brakeman or as a mechanic, I reply no; but I am constantly consulted, both by mechanics and inventors, as to the practicability of machinery connected with railroad-cars in general.

Int. 3. Should a mechanic or inventor call upon you with a model, in every respect, like the "B. and T. P. O. Model," with a brake applied therewith, in every respect like the one represented in said model, and should explain to you in detail, and ask your opinion as to whether said brake could be applied to a railroad-car and operated, would it be your opinion that it could be so applied and operated as to be an acceptable brake to railroad managers?

A. So far as concerns the hand operation of the brake I have no doubt that it could be so applied. I might suggest mere mechanical changes of arrangement, but there is a wide difference between such changes and the changes which involve invention, and the introduction of new principles of action.

251 I should see in this brake a method by which all the brakes of the car could be applied from either end of the car, and there is no mechanical fault of construction or difficulty in it whatever. I should prefer to operate the centre lever by pulling it instead of pushing it. But that is a mere mechanical change, which every mechanic understands.

Int. 4. Could you make the alterations referred to by which you would pull instead of push the centre lever without an entire reconstruction of the brake, substituting rods having a tensil' strain when operated for those as seen in the model which are operated by a pushing or thrust motion; and would you not have to make or apply additional parts to said reconstructed brake not found in the model in question?

A. It would be the simplest proposition that could be proposed to a mechanic. The substitution of parts having a tensil' strain for others having a thrust motion is not considered any problem at all. In the present instance he would simply have to elongate his connection between the windlass and the centre lever, so that instead of connecting with the brakes of the adjacent truck they should connect with those of the opposite truck after having been attached to the centre lever. That is one way in which it might be done, or the motion having once been communicated to the centre lever, and the question only being to communicate that motion to the brakes, he would use just such connections between the brakes and the lever as would answer his purpose. No invention would be required in all this, and any skillful mechanic would be able to accomplish it without the aid of his inventive faculties.

252 Int. 5. What, in your judgment, would be the length of a seventy-two seat passenger-car from king-bolt to king-bolt?

A. I have never made any measurement. I suppose it might be about forty feet.

Int. 6. What would be the length and size of the large rods, as seen in the "B. and T. P. O. Model," applied to such a car in the application of this brake to the same?

A. Not far from twenty-one or twenty-two feet in length. The size would depend altogether upon the material used and the construction employed.

Int. 7. What material would you recommend; wood or iron?

A. There would be no difficulty whatever in making it of wood. It is an entire mistake to suppose that a very strong bar would be required in the Tanner brake for this purpose; although the power applied by the windlass is multiplied before it reaches the brakes, only one-half of that power, before it is so multiplied, is at any time sustained by the rods shown in the original model and application of the Bachelder and Thompson brake. If a force of six hundred pounds be applied by either windlass, as it is in this model, only three hundred pounds can be at any time placed upon these bars, and for that purpose an exceedingly light wooden rod would be all sufficient, particularly if it were suspended by hangers from the car-body.

Int. 8. Referring to the model "B. and T. P. O. Model," if 600 pounds be applied at the windlass, what force would be exerted upon the centre pin of the pulley or shiff attached to the transom of the truck?

253 A. When the brakes were hard on twelve hundred pounds.

Int. 9. What force would be communicated to the top of the lever in the truck?

A. Six hundred pounds.

Int. 10. And what would be the thrusting force on the end of the centre lever?

A. Three hundred pounds.

Int. 11. Please explain how 600 pounds applied at one end of a [illegible] communicates only 300 pounds to the other end of the same rod?

A. I should be unwilling to attempt to explain that. The difficulty is that 600 pounds are not appiled to the end of the rod; the 600 pounds applied to the brake lever are divided between the two trucks, 300 of it being used up in applying the brakes of the adjacent truck, while only 300 of it is transmitted through the rod to the centre lever.

Int. 12. Dispensing with bumper arrangement, and rod "H" in said model, and also with the large rods, how would you prevent the levers in the trucks from falling upon the track in altering it over into a Tanner brake?

A. I do not understand what you mean by altering this brake into a Tanner brake; but if you will tell me exactly what alterations you propose, I will tell you what precautions I will propose to remedy any evils you may introduce.

Int. 13. I propose to inquire how you would fasten the levers in the trucks to prevent them from falling upon the track in the case supposed?

254 A. I would suspend them from any part of the truck that was nearest and handiest.

Int. 14. Then you are of the opinion that a brake, as set forth in the "B. and T. P. O. Model," with wooden rods connecting the centre lever and the other apparatus, as set forth in said model. would be an acceptable brake to railroad companies?

A. I am of the opinion that at the date of the application of Bachelder and Thompson it would be the best thing in existence, because, so far as my knowledge extends, it would be the only arrangement known by which all the brakes of a car could be applied from either end of the car. I am not prepared to say that the arrangement of the parts would be so perfect as that which we now have after ten or fifteen years' experience, but it would be of immense value, and consequently ought to be acceptable to railroad men, as it would be the introduction of a principle which has been adopted by them all over the country.

Int. 15. You speak of principle in the conclusion of the foregoing answer; please define, in brief, in what that principle consists.

A. That word "principle" cannot be defined,in brief, but I will define it in extenso, and then apply it to the model in question. The principle of a piece of mechanism is the mode of operation—that is to say, the mode of operation as distinguished from the mode of operation of previously existing mechanism of a similar class; so that when the word "principle" is used the words "distinguishing principle" are intended.

I will illustrate my meaning as follows: The principle of the
255 first gun invented is based upon the projection of a ball by the
generation of expansive gasses behind it and within a tube open at one end. In the attempt to cause the ball to rotate upon the axis of the gun, suppose a screw thread were cut on the interior of the barrel; suppose that on trial it was discovered that screw thread only stripped the lead from the ball and did mischief instead of causing the ball to rotate as desired. Manifestly no new principle would be introduced, no invention whatever would have been made, and the principle of the gun would remain exactly as though nothing had been attempted.

If another individual, seeking the same end, were to put a screw thread into the interior of his gun-barrel and were to make it so gradual that it would revolve the ball upon the axis of the gun, he would invent the rifle, introducing an entirely new and distinguishing principle with fire-arms.

Now, to apply this to the brake in question: In the "B. and T. P. O. Model" brake, so far as my knowledge extends, all the brakes may be applied from either end of the car, the levers and connecting-rods having, in themselves, sufficient elasticity and self-adjustability for the accomplishment of the end; this, I consider, introduces a new principle with car-brakes, notwithstanding the prior existence of the single brake, of the Milholland brake, and the Springfield brake, as the latter two were not carried out in a manner to insure success; consequently they were worthless. In my opinion, they stripped the lead off the ball, and the "B. and T. P. O. Model" did not.

Int. 16. You say the latter two, meaning the Milholland and Springfield brakes, "were not carried out in a manner to insure success—consequently they were worthless." Do you know such to be the fact?
256 A. I know nothing whatever about them, except so far as I
have testified my opinion in regard to their structure and operation as shown in the models.

Int. 17. Were 600 pounds applied to the end of the centre lever of the "B. and T. P. O. Model" what would be the force applied to the centre pin of the said lever?

A. Twelve hundred pounds.

Int. 18. You say, in your opinion, this brake would be acceptable to railroad companies at the time it was got up. Are you aware of the fact that the men who claim to be the inventors did attempt to apply said brake upon a car on a road entering this city; and that one of the parties, A. G. Bachelder, states that he abandoned the attempt, and that said brake, as shown in said model, never was applied to a railroad car?

A. I am not aware of that fact.

Int. 19. If the two chains attached to the windlasses, as seen in the model of the Springfield brake, were so adjusted as to operate the brakes of both tracks at one and the same time, and from either end of the car, would the brake be a double-acting brake?

A. Of course it would, if it operated them properly.

Int. 20. You speak of the operation of the Springfield brake upon curves. As a general thing, where does braking take place, upon curves or upon straight tracks,—at stations, or at points between stations?

A. The braking takes place wherever there is danger seen ahead, and may be called for on a curve as well as on a straight track. Yes,
danger is much more liable to be discovered suddenly, and to
257 require quick and powerful action upon the brakes, upon a curve

than upon a straight track; also, the braking takes place at the stations or stopping-places, and may be upon a curve or straight track. Take, as an example, the first eight stations out on the Boston and Worcester road; three of these eight require that the train be broken up on a curve; the other five are upon a straight track. This may be a large proportion. This example comes to my mind only on the instant, but it is clear that they must be provided for.

Int. 21. What does the curve of a railroad-track, as a general thing, amount to, the length of a passenger-car—say forty feet; that is, what is the distance between the centre of a circle of which the curve-track is a part and the cord of a circle forty feet in length? Would it be an inch?

A. That question is rather indefinite. Give me the radius of the curve of which you speak, and a table of logarithms and natural signs, and I will calculate for you exactly the versed sign of the arc of which the cord is forty feet, which is the distance you inquire of.

Int. 22. How is the operation of the centre lever brake upon curves affected by said curves when operated upon them, the centre lever connecting the brakes having an unyielding point?

A. If you examine the model of that brake carefully—the "Batchelder model," for instance—you will see that it cannot affect this brake to any appreciable, if to any, extent. In the first place, the centre lever is pivoted to the car-body—so are the windlasses by which the lever is operated—and you may turn the trucks round ninety degrees without in the least affecting thus much of the mechanism.

258 In the next place, the brake-levers are very near to the centre of the trucks, and are entirely free to swing—not having any rigid points—round so as to much more than accommodate themselves to any possible motion of the trucks when in use.

Int. 23. Do the same remarks apply to the centre lever brake, as seen in the Tanner brake, in the model marked "Patent Brake"?

A. Practically they do.

Int. 24. And, also, do they apply to the "B. and T. P. O. Model"?

A. Fully they do.

Int. 25. Do the same remarks apply to the Springfield model when adjusted, as set forth in a previous interrogatory, viz, the 19th cross-interrogatory?

A. The two chains attached to any one windlass in the Springfield brake cannot be so adjusted as to apply to the brakes of each truck simultaneously upon both straight and a curved track; therefore these remarks do not apply to that brake.

Int. 26. Can the Springfield brake be so adjusted as to apply the brakes of both trucks at one and the same time, when the car is running on a straight track, and from either end of the car?

A. I have not a doubt but that it can, and I have not a doubt but that if they were so applied, and were to run upon a curve while they were so applied—a thing which is done every day with car-brakes—the train would be exceedingly liable to jump the track, unless the chains were so light as to give way, and by their breaking save the other catastrophe.

259 Int. 27. Please explain how such a catastrophe could take place as that of throwing the train or the car from the track.

A. When the brakes were applied on the straight track, the short chain to the adjacent lever was strained tight, dragging the truck as far round to one side as the flanges of the wheels would permit.

Now, if we run upon a curve, which requires the truck to swivel in one direction, the brakes will be taken off by that motion, perhaps at the moment when they are most required; but if the curve turns in the other direction so as to swivel the trucks the other way, something must break or the car must go off the track, for the flanges are already hard up against the rail, and the truck, manifestly, can swivel no further so long as it remains on the rails.

Int. 28. Suppose you resolve the Springfield brake with two single brakes by removing the connecting-rods between the trucks and the chains connecting the rods and the windlasses, and then apply the brakes to one or both trucks of the car when upon a curve, will your foregoing remarks apply to that case?

A. If your levers are arranged exactly as they are in the Springfield brake, and placed in the same position, then they would be open to the same objection; but the trouble with the Springfield brake is that you are trying to put all the brakes of the car on from either end of the car, and that it cannot do both on a curved and straight track.

Int. 29. Do you not know that on many cars in this country, especially freight-cars, the brakes are applied to one truck by an ar-
260 rangement of a lever, chain, and connecting-rod, precisely like
the arrangement in either truck of the Springfield model, and that no such disasters as you contemplate happen from applying the brakes on a curve; and that even passenger-cars, ten years ago, in many parts of the country, had the brakes applied in the same way, to wit, the short arm of the lever being attached to the brake-bar, as seen in the model, just back of the windlass, and the fulcrum of this lever connected with the opposite brake-bar, and that no such disasters happened even to passenger-cars when the brake was applied upon curves, consequent upon such application?

A. I am aware that single-acting brakes were used some years ago, and I am also aware that the railroads got rid of them as soon as they got something better. I have no means of judging now how many of the accidents which have occurred to passenger-cars are traceable to the brakes.

But the freight-cars of now-a-days, which run on an average of perhaps not half the speed of passenger-cars, are much more liable to jump off the track; what they would do if the speed were increased to that of the passenger trains, I have no data from which to judge.

Int. 30. Assuming the statements in the foregoing interrogatory to be true, as any practical railroad man well knows, both as applied to passenger and freight cars, what do all your speculations and theories in relation to the application of brakes upon curves and the supposed disasters resulting therefrom amount to? Please sum it up.

A. They amount to just what I have stated. I believe that accidents of that nature are far less frequent upon cars furnished with double-acting
brakes than they are upon those furnished with single-acting
261 brakes; and my opinion is not in the slightest degree changed.
Your interrogatory has given but very few of the conditions necessary to be observed. You simply take the brake as it appears in the Springfield model, and unhook one of the chains; you do not give the position of the windlass, which, of course, is to be regarded as in the position which it occupies. The nearer that windlass is to the centre of the car, the less would be the liability spoken of.

Int. 31. Will your remark in a previous answer in relation to the operation of the centre-lever brake, as seen in the "Bachelder Model," the "Tanner Patent Brake Model," and the "B. and T. P. O. Model," upon curves, apply to the brake as seen in the Milholland model?

A. The Milholland model is not liable to these objections.

Int. 32. Is the drum or cylinder in the Milholland brake and the centre lever in the Tanner brake mechanical equivalents of each other when applied to the operation of railroad-car brakes; that is, do they perform the same office or function, to wit, apply the power exerted through the windlasses to the brakes of both trucks, and from either ends of the car?

A. In order that one device may be the mechanical equivalent of another, it is necessary not only that they perform the same duty, but that they perform it in the same manner. Now, as a general thing, so far as the transmission of force is concerned, a drum is the mechanical equivalent of a lever.

But there are certain cases where the elasticity of the lever may so aid in the performance of a duty that the drum shall not be the entire
equivalent of it. The great difference which I have pointed out
262 as existing between this brake and the Thompson and Bachelder
brake arises from the fact that the brake-levers in the former are
rigidly pivoted, while in the latter they are not.

Int. 33. In transmitting force, is the drum the mechanical equivalent of the centre lever?

A. It is, except so far as the action of the lever may be modified by its elasticity.

Int. 34. In applying 500 or 600 pounds to a centre lever, three inches, made of iron, by three fourths of an inch, which is the size of iron used in forging these levers, the length of which is from three and a half to four feet, how much elasticity or spring, under *under* such a force, would there be in the operation of this lever, if any?

A. There would not be much; but there would be some, unquestionably, and whatever it was it would help to qualify any bad result which might flow from the wearing of the brake-shoes. But this is a mere trifle compared with the other objection to the brake, which I have before mentioned.

Int. 35. Has the drum and the centre lever rigid fulcrums, one and both?

A. Both of them.

Int. 36. Should the size of the drum be reduced to one-half, to which the chains connecting the brakes are applied, the other part of the drum to which the chains connecting the windlasses are attached being unaltered, would there be a different result in the transmission of the power?

A. Yes; double the amount of force would thereby be transmitted to
the brake-shoes.
263 Int. 37. Does such a change involve invention or constitute in-
vention?

A. It does not, because as the drum is placed there that evidently could be done without any difficulty whatever.

Int. 38. Would the elongation of the levers in each truck of the Milholland brake (the attachments on either side of the centre-pin upon which the lever is suspended being the same) produce a greater power on either brake-bar when power is applied to the top of said lever so elongated?

A. If you could fix it in that way it would produce a greater power on each brake-bar.

Int. 39. Would this change involve invention?

A. It would not.

Int. 40. Were the levers so elongated connected with a swing attached to the transome timbers of the truck as they are frequently upon the brake-bar of a truck (which is but a swing), would that constitute invention ?

A. There are two different methods of hanging the levers proposed in this question; one of them is to attach the brake-lever directly to the brake bar. Now, I do not see how that is going to be done without a change in this brake which would constitute invention. The other is to suspend the lever.

Now, if either of these were done, or could be done, so as to get rid of the rigid fulcrum, then all the evil results flowing from the use of the rigid fulcrum would be avoided. In making an invention of this character a man has first to conceive and understand the difficulty, and
then originate the method of avoiding it.

264 Now, a great, and as I consider, a fatal objection exists in this
brake. There is no evidence in the brake itself that the man who got it up understood the difficulty. On the contrary, it would appear that he did not, and I am clearly of opinion that whoever made this change in the nature of those levers for the purpose of giving them new capabilities to the brake, did exercise invention.

Int. 41. Would a substitution of the brake levers and connections, as seen in the Springfield brake, and upon the ends of the trucks nearest the centre of the car, neither of which levers have a rigid fulcrum, for the levers in the two trucks of the Millholland brake and the connection of these levers with the drum, constitute invention ?

A. If you accomplish anything by so doing, it would; but the trouble is, you would make a worse than useless thing of it. It would not work at all. For, allowing the connection between the windlass and the drum to remain the same, the inside brake levers of all would swing about without any fulcrum. The interrogatory does not state how the outside levers are to be operated, and evidently the conditions of the change are not all given.

Int. 42. Does the Millholland brake so combine the brakes of the two trucks of the car with the drum and the windlass of the car as to enable the brakeman to bring or force the brakes against their respective wheels, whether he be at the forward or rear end of the car ?

A. It does not, for reasons which I have fully stated before.

Int. 43. Have you not stated, in answer to a previous interrogatory, that 600 pounds applied to the windlass of the Millholland brake would
transmit 160 pounds to the brake-bars of each truck ?

265 A. So it would as long as the parts are in exact adjustment
and the brake-shoes unworn. The difficulty of this brake is that that will not be the case if the shoes wear irregularly or the parts get out of adjustment.

Int. 44. Will not the same remarks apply, to a certain extent, to the Tanner brake; that is, so far as the centre lever and its unyielding fulcrum is concerned ?

A. The same objection applies to the Tanner centre lever, so far as it goes, but to a much greater degree to the Millholland. No machinery is perfect, but begins to be practically useful when the difficulties to its action are so far removed that it will do the duty required of it well.

Int. 45. Are the levers and their connections with the brake-bars of the trucks, as seen in the "B. and T. P. O. Model," the Bachelder Model, and the Tanner Patent Model, any part of the invention aimed to be set forth in these models ?

A. Unqestionably they are a most material part of every one of them. The Bachelder and Thompson invention is not any particular lever or rod, or device. It is the assemblage of all the parts necessary to make up their double-acting brake.

Int. 46. Removing the centre lever from these several models, is there anything in any arrangement of brakes in either truck belonging to the claimants of inventions as connected with these several brakes?

A. If you remove the centre lever you have nothing left but a parcel of sticks and rods of iron; certainly no double-acting car-brake, which is what I understand their invention to be; and the same may be said of any of the levers, bars, brake-shoes, or whatever they may be, which go to form their brake.

266 The difficulty seems to be the singling out of one particular element of a piece of mechanism and considering that as the invention. That can scarcely ever be done, for that one element is dependent upon the proper performance of the duty of several other elements, all of which have to combine and conspire to produce the desired result.

Int. 47. In what does the claim of invention by Bachelder and Thompson consist beyond the combination of the brakes of the trucks as they found them in use upon cars at the time of getting out their brake, beyond the connection of said brakes with the centre lever and windlasses of the car?

A. You have not given the claim in the words in the patent, which states, after describing the whole arrangement of the brake mechanism, that "what is claimed by us is so to combine the brakes of the two trucks with the operative windlasses or their equivalents at both ends of the car by means of the vibrating lever A, or mechanism essentially as specified, as to enable the brakeman, by operating either of the windlasses, to simultaneously apply the brakes of both trucks, or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car."

Now, the vibrating lever A does not reach all the way from the windlasses to the brakes. If it did, it would be the only thing required to combine these two elements stated in the claim. There are certain other elements that conspire to effect this combination; in fact, it is the whole system, the centre lever being the controlling element.

Int. 48. Is there anything in the Tanner patent which speaks of the distribution of power upon the brakes—of the amount of power to be applied; in short, is there anything said in said patent upon 267 this point beyond the statement of the fact of so combining the brakes of the two trucks and the windlasses of the car as to enable the brakeman to apply the brakes to both trucks from either end of the car, and does not the Milholland brake do the same thing?

A. There is a great deal said in the patent upon the subject. The patent commences with the statement that Bachelder and Thompson "have invented a new and useful mode of operating the brakes of railway cars," and further on "that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and reference thereof."

Now, this mode of operation, which is stated to be the invention, is particularly described in the specification, and is plainly represented in the drawings. The drawings show exactly how the power is distributed upon the brakes, as well as the amount of power so applied, as compared with the power applied to the centre lever by the windlasses.

Int. 49. Then the mode of operation is the invention, is it?

A. I have stated several times my view of the invention, and can repeat it, if desired.

Int. 50. Do you base your opinion that the Stevens patent is embodied in the Tanner patent upon the fact that both are alike in their operation; that is to say, from either end of the car? Please explain the matter fully.

A. Not exactly. In the Tanner patent the power to operate the brakes is transmitted from either windlass to a device, which then communicates it to the brakes of each truck, the result, or the thing accomplished, being that all the brakes are applied when either one of the windlasses are operated.

268 The device which Tanner uses is a horizontal lever pivoted to the centre of the car-body, but he expressly states in his claim that not only such lever may be employed for the purpose, but any equivalent therefor. It must also be remembered that patents are not granted for things or levers or devices, or even for collections or combinations of things or devices, irrespective of the duties performed by such devices or combinations, or irrespective of the parts with which they necessarily act in concert.

It is the grand result, the duty performed by the things as a whole, which is the real groundwork of the patent. The real groundwork of the Tanner patent is the object gained in the applying of all the brakes by operating either one of the windlasses. This is not accomplished by the central lever alone, nor is this alone the means of connecting the windlasses with the brakes, but there are other intermediate parts required, and it is evidently to make this claim that the patent somewhere states the invention to be a "mode of operation," which it assuredly is, this "mode of operation" being the mode recapitulated in the claim, of applying all the brakes by operating the windlass at either end of the car.

On referring to the Stevens brake we find the power of the windlass applied to "something" from which it is communicated to all the brakes of the car, and this may be done by operating the windlass at either end of the car.

The "something" in this case is a lever, which, instead of lying in a horizontal position, as in the Tanner patent, stands in a vertical position; but this does not alter the case in the least; it serves to transmit the power communicated to it to all the brakes, and for this
269 purpose it is the entire equivalent of the horizontal lever of the Tanner system.

The case is not at all altered if the lever employed in the Stevens brake be one of the brake levers, so long as taken in connection with the parts that operate in immediate combination with it; it performs the duty performed by the Tanner device taken in connection with the parts operating in immediate connection with it, and so long as the duty is performed in the two cases in a manner substantially similar.

If the Stevens system contained any imperfection, anything which would materially prevent it from acting practically and usefully as a brake, or if it showed an entirely different mode of operation, then it would not be embodied in the Tanner patent; these are the reasons which lead me to the conclusion that the Stevens brake is embodied in the Tanner patent.

To make a little clearer this subject of equivalent devices, I will mention an instance where this same duty of applying all the brakes of the cars from either end of the car has been attempted to be performed, and which, if entirely successful, would not have been embodied in the Tanner patent. A great variety of car-brakes have been devised, in which the brakes were applied in the same way by steam; in one of these the steam was carried the whole length of the train in a pipe, and was let into small cylinders on each car, and the force thus generated by the motion of the pistons within the cylinders was made to apply the brakes.

Now, if the chain on each windlass were so connected with a cock on the steam-pipe as to let steam into the small cylinder, and the thing would operate, we would have a method of applying all the brakes of the car by operating the windlass at either end of the car, 270 but it would not act on the same principle as the system of levers in the Tanner brake; there would be no equivalent for the lever which receives the power applied by the windlasses and transmits it to the brakes; the mode of operation would be different, and therefore the principle would be different.

I give this simply as an illustration to show that the Stevens brake is not embodied in the Tanner patent simply because it is like it in operation, or simply because it accomplishes the same end, but because it accomplishes the same end by means substantially similar in operation, or by means of the devices which are the equivalents of those described in the Tanner patent; for it could not be said that a steam-cylinder was the equivalent of a lever; nor is the "mode of operation," when we let steam from a steam-pipe into a cylinder, the same as when we pull round a lever by means of a windlass and a chain.

Int. 51. Had James Milholland, at the time of getting out his brake—that is to say, about the year 1843 or 1844—filed a model of his brake in the Patent Office, with specifications to correspond, concluding with a claim in the precise language of that in the Tanner patent, as quoted by you in your answer to the 47th cross-interrogatory, but substituting the word "drum" instead of the expression "vibrating lever A," and then answer, could the office have consistently refused him a patent? And, further, would the office have been justified in anticipating the improvements which might be made in brakes for six or eight years thereafter upon this method of applying brakes, and in saying to M'r Milholland, "Your application for alleged improvement in car-brakes has been examined; the improvement is undoubtedly new, but not useful?" 271 And, again, can this fact be denied, that James Milholland did combine the brakes of both trucks of a car and operate them from either end; and does the claim of Henry Tanner call for anything more? In short, has rigidity of parts, the amount of force, or equality of force applied to the several brakes, anything to do with the matter at issue beyond the mere application of force to the brakes of both trucks from either end of the car?

A. If the Patent Office were of opinion that the Milholland brake would not operate successfully and prove practically useful, they undoubtedly would refuse him a patent; if there was a doubt upon the subject they might grant him the patent, and let him try his chance in the courts, as all patents have to do before they are really sustained.

The Patent Office would certainly not be justified in anticipating an uncertain yet to be made; the Patent Office certainly would be justified, in view of the words of the law, in refusing a patent for any application which was deemed not to be useful. It certainly cannot be denied—I mean, at least, that I cannot deny it—that Milholland attempted to combine the operating brakes of both trucks with the windlasses, so that all the brakes might be applied by either windlass; but the question now is whether he really did succeed in doing that. I think he did not, for reasons which I have already given in full. Tanner certainly does not claim more than that.

Rigidity of parts, amount of force applied, equality of force, or any other characteristics which go to make up the successful operation, in practice, of any of the brakes under consideration, have certainly everything to do with matter at issue.

272 Int. 52. Is there any allusion to the hand-brake, and the operation of the same, in the application of Bachelder and Thompson, other than that found on the drawings accompanying said application, namely, "I is a purchase attached to the connecting rods, by which the brake may be applied by hand at pleasure;" and is not the description of the operation in the specification proper, exclusively confined to the operation of the brake by the bumpers, making no allusion to their operation by hand; thus showing that, in the mind of the applicant, the hand-breaking quality was only incidental and subservient to the bumper arrangement; and is there anything said about a brake operated by hand from either end of the car; and is not this feature the prominent one in the specification and claim of Henry Tanner, assignee of said Bachelder and Thompson, in his application based upon said Bachelder and Thompson's application, the said Tanner making no mention of the brake as a bumper-brake, except in the way of disclaiming?

A. I see no propriety in speaking of any portion of the specification as the specification proper; in this, as in the great majority of cases, the specification is made up of the descriptive portion, the claim, and "the drawings." In the present instance the applicants state that "the drawings make this specification." The descriptive part of the specification states that the applicants "have invented an improvement upon the car-brake now in general use," and then refers directly to the drawing as "making the specification."

Upon the drawings I find all the parts by which the brakes are applied by hand designated by letters and described, while the bumper itself is not designated by letter, and is simply referred to in the descriptive part of the specification; but whatever was or was not shown in the very imperfect papers and drawings which accompanied the original application has nothing whatever to do with what was really the nature of the brake. 273

If this is clear, from either the model, the drawings, or the description, or from all combined, and compared with each other, that settles the question.

A patent will not be granted upon imperfect papers, or unartistic drawings, but every facility is allowed to inventors, particularly to those who have not the means to employ an agent, or who try to do their own business, to modify and correct and alter their papers before the examination of their applications. Three-fourths of all the applications for patents made by inventors themselves, without the assistance of an agent, are imperfect as regards the papers or drawings, but I never heard of a patent being invalidated on this account.

I do not think that there is anything in these imperfect papers tending to show "that in the mind of the applicant the hand-braking quality was only incidental to the bumper arrangement." The papers do show that the man who prepared them was totally and entirely ignorant of what he undertook to do. There is in the descriptive part of the original specification a distinct allusion to the application of all the brakes of the car by a single windlass, as follows: "When the engine is detached one brakeman is sufficient to do the work of any number of cars." This refers, evidently, to brakeing up a train, as is constantly done at stations after the engine is detached.

In such case, if the brakes of one car be applied, the brake of that car only will be detached from the bumpers, and the other cars crowding upon this versed car will have all their brakes applied by the bumpers which were not detached, and thus "one brakeman is sufficient to do the work for any number of cars."

274 On referring either to the drawing or the model to see what this brakeman must inevitably do, we find that he applies all the brakes of the car upon which he is operating; this is as clear as though it were told in other words, and this is the feature which is prominent in Tanner's specification, which was based upon the said prior application of Bachelder and Thompson. I believe no mention in Tanner's application of the bumper arrangement except to disclaim it.

Int. 53. Is it the privilege of an expert, under oath, to evade the obvious answer to a question?

A. It is not a privilege which I take.

Int. 54. Is it your privilege to turn lawyer and plead the cause of your client?

A. It is my privilege to answer the question put to me. If these questions are of a nature to require explanations, I give them. It is my privilege to testify to my opinion upon all the subjects inquired.

Int. 55. Are the parts represented in the specification of Bachelder and Thompson's application by the letters B, G, J, and C a part of the said Bachelder and Thompson's invention?

A. The parts inquired of are all necessary to the brake, and it is the brake, as a whole, operating as it does, which constitutes the invention. No particular parts singled out are the invention; no particular parts are part of the invention, except so far as they go to make up a mode of operation and the grand result.

Int. 56. Bachelder and Thompson say, in their specification, "the original uncertain we disclaim." What significance do you give to this clause?

275 A. I think they meant the old hand-brake.

Int. 57. Was the old hand-brake pointed out in the letters referred to and set forth in the 55th cross-interrogatory?

A. Those letters indicate a brake upon a single truck. I have no recollection of one arranged exactly in that manner, but there may have been.

Int. 58. Did Bachelder and Thompson do anything more than simply connect the levers of the old brake in each truck by a vibrating lever and two connecting-rods?

A. If that was all they did, they did enough to make themselves inventors; but they did a great deal more; they re-arranged the other parts for the purpose of accommodating them to the new elements introduced, and thus bring about the result.

Int. 59. Was not all this accomplished by other parties long prior to the application of Bachelder and Thompson at the Patent Office for a patent?

A. Not to my knowledge; it was not, so far as I am informed. The result was never obtained before which they accomplished. In my opinion all previous attempts were failures.

Int. 60. Are you acquainted with Henry Tanner, and where did your acquaintance first commence?

A. I am acquainted with him; my acquaintance commenced in the Patent Office, where he appeared as applicant for the reissue of C. B. Turner's patent car-brake.

Int. 61. When was that?

A. I do not remember the exact date.

276 Int. 62. Was it prior to his application for a patent as assignee of Bachelder and Thompson?

A. It was.

Int. 63. It is usual for examiners in the Patent Office to be familiarly acquainted with the applicants for patents when they have agents to attend to their business?

A. It is usual for the public officers in Washington, or anywhere else, I presume, to be acquainted with those having business before them; and it is usual for applicants for patents, whether they have agents or not, to come before the examiners, on certain days of the week, to explain their invention.

Int. 64. Did you conduct the official correspondence with said Tanner's agent in relation to his application as the assignee of Bachelder and Thompson?

A. I have not a doubt but that I conducted the whole of the correspondence, which was, of course, signed by the Commissioner of Patents.

Int. 65. Is the following letter a part of your correspondence to the agent of Bachelder and Thompson, and Henry Tanner, namely:

"PATENT OFFICE, *October* 17, 1851.

"GENTLEMEN: Specifications and drawings of your alleged improvements in railroad-car brakes are herewith returned for entire insufficiency. The office, from what it can learn of the case, cannot encourage you, however, to prosecute the application further."

Did this letter grow out of the pencilling in the margin or end of said application, which reads as follows:

277 "The specifications and drawings are very defective. The specification does not describe the nature, construction, or operation of the alleged improvement. The claim is the application to car-brakes to prevent collsions, and so forth. The claim must be clear and specific. The claim here set up would cover every kind of car-brake. The drawings do not illustrate the operations of the brake. There must be more carefully prepared specifications and drawings furnished before this case can be considered; but this must be returned to the office without erasing these pencil-notes. There is also an omission in the oath. There must be two witnesses to each signature. See inclosed circular."

A. I have no means of knowing, but I have no doubt that the letter was written by myself; the pencil-notes were not made by myself, so far as I can now remember; it was always the duty of the assistant examiner to make these preliminary examinations; I see no indication in the style, or otherwise, of the remarks that leads me to judge who made them; the letter was, of course, written in consequence of the imperfect state in which the papers were found.

Int. 66. Was there a letter received at the Patent Office, in the spring of 1852, from R. H. Eddy, of Boston, agent of Henry Tanner, in which this paragraph occurs, viz: "I also return to you, not amended, the specification for the reissue of the patent of Charles B. Turner, assignee, to Henry Tanner. To the said specification you will find appended (by wafer) a piece of paper on which is written the claim that, I understand from Mr. Tanner, the Patent Office was willing to allow him previous to the pending application of Thompson and Bachelder." Was this claim, so appended by wafer, the one, in all the essential parts or 278 phraseology, which was passed over into the application and specification of Henry Tanner as the assignee of Bachelder and Thompson?

A. I have no doubt that such a letter was received; of course I have no means of verifying the phraseology, but I have no doubt of it; I have no recollection whatever of the slip of paper referred to, or of the nature of the claim upon it.

Int. 67. Had the application of Bachelder and Thompson remained undiscovered, and which, you have said, was discovered by a certain letter, and the reissue of said C. B. Turner's patent had been granted by the office, claiming the centre lever and its connections, as in the Thompson and Bachelder application, would the Turner brake, as a whole, in your opinion, have been an acceptable one, practically speaking, to railroad companies?

(Plaintiff objects to this interrogatory.)

A. I have not examined the Turner patent for some time, and I should require to do so before I could answer the question; I have no recollection what was the nature of the claim which the Patent Office decided to allow him a reissue; the question seems to assume that it was similar to the one granted to Bachelder and Thompson; whether it was or not, I do not know.

Int. 68. Were you examined as an expert in this office one year ago this present month, at which time a model of the Turner brake was thoroughly examined by yourself; and, in view of that examination, can you not give an explicit answer to the last clause of the foregoing interrogatory?

279 A. I was examined upon car-brakes, as you state, last year; the exact date I have no means of fixing; the Turner brake being then before me, but its exact nature is not sufficiently in my mind at present to enable me to answer the question. Show me the patent, or the model, and I will give you my opinion; there may be peculiarities in it which I have never before discovered which would materially modify my reply.

Int. 69. "PATENT OFFICE, *April* 30, 1852.

"SIR: In accordance with the request contained in Mr. Eddy's letter of the 13th instant, the old patent in the case of application for the reissue of C. B. Turner's car-brake is herewith returned to you. There is an entire difference of arrangement in the details of the models and drawings belonging to the application of Thompson and Bachelder, which should be removed by the substitution of either new drawings or model. The case is, in consequence, postponed until further advices from you.

(Signed) "Respectfully, yours,

"THOMAS EWBANK,

"*Commissioner of Patents.*

"HENRY TANNER, care of R. H. Eddy, Boston, Mass."

Does the letter, of which the above is a copy, in speaking of drawings belonging to the application of Thompson and Bachelder, refer to those accompanying his letters patent now shown to the witness?

(Plaintiff objects to this interrogatory.)

A. I presume it does.

Int. 70. Did not this indication open the way for said Tanner to file a new model, of which the Tanner Patent Office model is a correct representation?

280 A. Of course it did; the model was demanded by the office.

Int. 71. Was that demand of the Patent Office embodied in yourself as chief examiner; that is, were you the person making this demand?

A. If the letter above be a copy of any letter written by the Patent Office, and I have no reason to doubt that it is, I wrote the letter. It seems that when Tanner's agent returned the case to the office for consideration, he saw fit to leave out of the case the method of applying the brakes by the bumpers. Now the Patent Office demand, or they did in those days, that the model, drawings, and specifications, in each case, shall correspond with each other.

When the new drawings came in they did not correspond with the old model in this respect: that the latter showed a method of applying the brakes by the bumpers, while the drawings did not; consequently, he was told that he must do one of two things; that he must either furnish new drawings to correspond with the old model, or a new model to correspond with the new drawings, and it seems he chose the latter.

Int. 72. Did you do anything, directly or indirectly, expressed or implied, in framing the claim set forth in the Tanner patent?

A. I have not the slightest recollection upon the subject; we often did when a man had no agent; very seldom when he had.

Int. 73. Did you, after vacating your position as chief examiner in the Patent Office—that is to say, about the year 1853 or 1854—pre-
281 pare a letter addressed to Henry Tanner, the substance of which may be stated as follows, namely:

"I was in the Patent Office when the patents of Turner, Hodge and Stevens, and Tanner, were granted, and *that* I was connected with the examination and granting of those patents; that upon the application of said Tanner for the reissue of C. B. Turner's patent on car-brakes and before said reissue was granted, the application of Bachelder and Thompson was accidentally discovered and the reissue of the said Turner patent was denied;" and concluding said letter by summing up your opinion as follows, viz: "Any car-brake which combines the brakes of both trucks, and operates them from either end of the car, is a clear violation of your patent;" and did you, about the same time, prepare another letter for one Nehemiah Hodge, vindicating the action of the Patent Office for granting a patent to Francis A. Stevens for an improvement in railroad-car brakes after rejecting his application upon the patent of Hodge; in that vindication did you analyze the Hodge patent and the Stevens patent, and conclude by saying that before granting the Stevens patent you consulted one or more of your colleagues, and that there was no doubt in your minds that the Stevens patent was an improvement of the Hodge patent; both of these letters have been published over your name. Did you prepare such letters?

A. I have no means of knowing, at the present time, whether you have correctly quoted from those letters; I have no doubt that I wrote letters of that character; I know I did the one to Hodge, and I never have had a doubt not only that Stevens' patent was properly granted but also that it was an improvement of the Hodge patent.

282 I also distinctly remember consulting with the older examiners in the office, because the matter seemed to be one requiring peculiar care, and because M'r Fitzgerald, one of them, had, for a great many years previous, had charge of this class of inventions, and had granted the original patent to C. B. Turner.

Int. 74. Is not this the summing up of the whole matter at issue in this case, namely: One Henry Tanner was allowed to file in the Patent Office new specifications and a new model, made to conform to and embrace all improvements in railroad-car brakes, patented and otherwise, which had been made up to the year 1852, basing his claim upon an impracticable and inoperative brake when applied as intended, a model of which was filed in the Patent Office in June, 1847, by one Bachelder and Thompson, men of no practical experience in railroad machinery, and who were allowed, through their assignee, the said Tanner, to frame a claim, if valid, that subjects every form of brake that combines the brakes of both trucks so as to operate them from either end of the car, thus lapping over patents and improvements in brakes of prior date, such as the Stevens brake, the Hodge brake, the Turner brake, the Nichols brake, the Milholland brake, and others that might be named; and were you not a party to this injustice, innocent or otherwise, put upon railroad companies through your agency as chief examiner in the Patent Office; and have you not, since that time, as expert and otherwise, availed yourself of the opportunity to perpetuate this injustice?

A. You have not stated my understanding of the case; and, with regard to my action in the matter, whether as a public officer or as an expert when called to testify, everything I have done is open to inspection.

283 Direct examination resumed:

1. Direct resumed. Were these new drawings furnished in the Bachelder and Thompson case before the patent was granted? If yea, why were they so furnished?

A. New drawings were furnished, because the Patent Office, in accordance with its custom, had demanded them in place of the ones first furnished, which were not sufficiently artistic to accompany the patent.

2. Direct resumed. How did it happen that Bachelder and Thompson's application for a patent was delayed in the Patent Office?

A. I have no knowledge with regard to the delay in this individual case, except that it was delayed. The business of the office was then more than a year behindhand, so that no new application for patent could be examined under at least a twelvemonth; this caused a great accumulation of unexamined cases, and applications were much more liable then to be overlooked than they are when the business of the office is up; at all times, however, applications for patents are liable to be overlooked and delayed until inquired for by the applicants or their agents.

3. Direct resumed. Please look at letter dated December 9, 1847, referred to by defendants' counsel, in A. J. Bellows' testimony in this case, and state whether or not any action was taken on said letter by the Patent Office at or about the time of its date?

A. On referring to the file wrapper in the case of Bachelder and Thompson's application, it appears that no action was had on the letter, and no notice was taken of it; every action that is had upon a case in the Patent Office is mentioned in the file of that case. 284

The first notice of action on the part of the examiner is under date of October, 1850—"Specification and drawing returned to agent;" if there had been any other action previous to that, it would have been mentioned upon the file.

4. Direct resumed. Please examine the pencillings referred to in the 65th cross interrogatory and state whose work that is, and for what purpose made?

A. The principal examiner decides all matters relating to the novelty and patentability of inventors; the assistant examiner decides whether the drawing and description are sufficient to give a clear and exact understanding of the invention; also, whether they correspond with the model; these pencillings were evidently made by the assistant examiner before he handed the case to the examiner, or else before he himself sent it back, for he very often himself attends to that duty, without bringing an imperfectly-prepared application to the notice of the examiner.

SAM. COOPER.

285 *Deposition of James M. Hebard.*

Q. 1. What is your name, age, residence, and occupation ?

A. James M. Hebard ; 47 years of age ; reside in New York, and am a railroad agent.

Q. 2. Were you examined as a witness in this case a few weeks ago on the part of defendants ?

A. Yes, I was.

Q. 3. Did you then testify that a certain long baggage-car was built by the Hartford and New Haven Railroad Company, and that said car was completed in the spring of 1847, and that Willard I. Nichols directed John Stockbridge to put a new brake on said car in that spring after said car was completed ; upon reflection are you able now to state whether that new baggage-car was completed and said brake put upon it in the spring of 1847, or the spring after ?

A. I testified that it was my impression that it was finished in the spring of 1847 ; my impression is the same now ; I know of nothing to vary it ; I have nothing to fix the date as to when the car was finished ; I can't fix the time when the car was finished any better than the time when M'r Stockbridge commenced ; to the best of my belief that car was built in the winter of 1846 and 1847.

Q. 4. Are you able to state positively that that car was completed before the spring of 1848 ?

A. I can't be positive, but think it was finished in the spring of 1847.

286 Cross-examined by M'r Whipple, counsel for defendants :

Cross-q. 5. Were the preliminary experiments made by you in the winter of 1846 and 1847, upon the direction of said Willard I. Nichols, of said brake in question, upon an old car, preparatory to its application upon said new car ?

A. To my best knowledge and belief all that work was done in the winter of 1846 and 1847.

Direct resumed by Mr. Sayles in person :

Q. 6. Are you able to state positively that those experiments on said brake were made in the winter of 1846 and 1847, and not at a later date ?

A. I can recall no circumstance to vary my previous answer; it is according to my best knowledge and belief ; I don't feel justified in swearing positive.

JAMES M. HEBARD.

Subscribed and sworn to before me, this 1st day of November, 1862.

R. E. STILWELL,
U. S. Commissioner.

287 *Deposition of John Stockbridge.*

Q. 1. What is your name, age, residence, and occupation ?

A. John Stockbridge ; 46 years of age ; reside in Weathersfield, Connecticut, and am a house-joiner.

Q. 2. Were you ever employed by the Hartford and New Haven Railroad Company? If yea, when did you commence work for them?

A. I was; I commenced work there on the first of April, 1848; I worked under Williard I. Nichols; the first work I done when I went there was to repair freight-cars, and after I had been there a short time he directed me to apply a double brake to a new long baggage-car; after I got through with that, as near as I can recollect, I went on the same work of repairing freight-cars.

Cross-examined by M'r Whipple on the part of defendants:

Cross-q. 3. Did you hear it stated by any party or parties at the time or after your entering into the employment of the New Haven and Hartford Railroad Company, that said double brake in question had been applied to a car previously?

A. I have a faint recollection that some of the men said it had been applied and taken off on account, I think, of its not working well.

Direct resumed by M'r Sayles:

288 Q. 4. What circumstance, or circumstances, is there by which you are able to fix the time when you commenced work for said company?

A. The company's books and the place where I lived; that fall after I commenced working for them I had an increase in my family; she would have been fourteen years old last month, if she had lived; this increase was a daughter.

Cross resumed:

Cross-q. 5. Do you recollect the circumstance that, in view of the part which James M. Hebard took in applying the brake in question and experimenting therewith, was called by the hands "professor of brakes"?

A. I do not recollect that.

JOHN STOCKBRIDGE.

Subscribed and sworn to before me this 1st November, 1862.

R. E. STILWELL,
U. S. Commissioner.

Deposition of H. T. Douglass.

Q. 1. What is your name, age, residence, and occupation?

A. Hebron T. Douglas; 45 years of age; reside at New Haven, Connecticut, and have charge of the cars on the New York and New Haven Railroad, as master mechanic of repairs, and have been so for about ten years, I think.

Q. 2. Does the New York and New Haven Railroad form a part of the line of railroad between New York and Boston, via Springfield, Massachusetts?

A. It does.

289 Q. 3. Was the brake that was used on the cars called the "line-cars," running between New York and Boston, removed some five or six years ago by the Western Railroad Company, and another brake put on in their place? If yea, what brake was put on in their place, and how did that brake answer the purpose? Please explain.

A. As near as I can recollect with regard to dates, I couldn't say positively whether it was 5, 6, or 7 years ago. The brake that was taken off was what we call the Hodge brake, and as regards the other I don't know that I ever heard any name for it till quite lately at least.

The brake that was put on by the Western Railroad Company, as I understand it, was something like the brake on model marked "Springfield brake, C. F. H." There is some difference about the arrangement of this brake from that put on the "line-cars," but perhaps wouldn't alter the working of it very materially, according to the best of my judgment. Personally I didn't know but very little about it, only from men who worked under me for the company. They reported to me that it did not work. The brakeman on the trains, and the conductor, reported this. When going into Canal street station, or turning short corners, it would sometimes apply the brakes of themselves, and then sometimes they would have to unscrew nuts to loosen them so that the horses or teams could start the car. The impression was general on the road that these brakes were not what they ought to be. They complained that they could not stop the trains.

They used to run one car behind the train of cars which had the Springfield brakes on, with a different brake on, for the reason that they did not consider it safe to run the cars alone with the Springfield
brake. The brake that they usually run on the car behind the
290 train was the Hodge brake. Sometimes they would run a Springfield or New Haven and Hartford car behind the train with a different brake from the Hodge brake.

(All the above testimony, as hearsay, objected to.)

I am not familiar with the name of the brake they run on the New Haven, Hartford and Springfield car, but, as near as I can recollect, it had a single lever in the centre of the car.

Q. 4. Were those cars that you speak of, that were run behind the train, often run empty and only for the purpose of stopping the train?

A. They were frequently, according to the wishes of the conductor.

Q. 5. Were you the proper person for those running the trains to report to in case there was any trouble with the machinery by which the trains were managed, such as brakes, or any other machinery; and is it one part of your business, as master mechanic of said road, to require those operating the trains on said road to report to you any inefficiency in the working of the machinery on said trains?

A. As far as cars are concerned, I think it is. The engine machine I have nothing to do with. They have orders, if there is anything wrong about the train, to report to me, and they do report to me.

Q. 6. About how long were the Springfield break' continued on said cars, and what brake was put on in their place, if any?

A. I couldn't say, exactly, but should say in the neighborhood of six months or a year. They were then replaced by the Hodge brake.

291 Cross-examined by M'r Whipple:

Cross-q. 7. Are the "line-cars," so called, the property of the New York and New Haven Railroad Company, or of the four companies that make up the line between New York and Boston?

A. The four companies, as I have always understood it.

Cross-q. 8. Do not those four companies employ a man whose special business it is to superintend the repairs of the cars of this line, viz, the New York Express line of cars, to which the brake in question was applied?

A. They have employed a man for the last two to four years, as near as I know. I did not know of one before that.

Cross-q. 9. Is it not, and was it not, the duty of brakemen and conductors to make their complaint of this man employed by the four companies, if they had any to make in relation to inoperativeness of any car-machinery connected with the line?

A. The men on the New York and New Haven road, if there was anything wrong about the train, usually notify me.

Cross-q. 10. Was there a car run behind the train having a Springfield brake thereon, said car having a different brake, as you have stated, from Boston to New York, and *a* vice versa, with passengers therein or otherwise?

A. When I spoke of that I spoke of the New York and New Haven Railroad. The other roads I do not know about.

292 Cross-q. 11. Were the curves you speak of in the city of New York those which pass from one street to another, running at right angles with each other, around which the railroad was made to pass?

A. I was speaking more in reference to where they went into the depot, or any very short curve, such as at the corner of streets.

Cross-q. 12. How long, to your knowledge, has the centre lever brake, spoken of by you in a previous answer, been in use on the Hartford and Springfield road which terminates in New Haven; since what year have they been so used?

A. To the best of my knowledge I should think from four to six years; may be longer. I haven't got the dates. It may have been from 1854 to 1856, to the best of my knowledge.

Corss-q. 13. And may they not have been in use at a much earlier date, so far as you know?

A. They may have been.

Cross-q. 14. Who did you understand, upon your first acquaintance with said brake, was the person applying it to the cars of the said Hartford and Springfield road?

A. I can't answer that question, for I don't know that I heard any name.

Cross-q. 15. Did you know Willard I. Nichols, deceased, when he was master mechanic of said Hartford and Springfield road?

A. I did not.

293 Cross-q. 16. Did the Springfield brake, alluded to in your direct examination, and as applied to the line-cars, combine the brakes of both trucks so as to enable the brakeman to operate them from either end of the cars?

A. I should say not very effectively on both trucks.

Cross-q. 17. Did it apply the brakes to both trucks from either end of the car, whether it did it effectually or not?

A. According to the best of my knowledge, it did.

Direct resumed by M'r Sayles:

Q. 18. Did you often complain of said Springfield brake to the officers or mechanics of the Western Railroad Company, and request them to have these brakes removed and the Hodge brake put in their place?

A. I did not personally to their mechanics; I complained of them to our superintendent.

Cross resumed:

Cross-q. 19. At this time at which you stated you made complaint to the superintendent, did the New York and New Haven Railroad Company own the right to use the Hodge patent car-brake on their road?

A. They did, to the best of my knowledge.

Cross-q. 20. Did the Western Railroad Company own the right to use said Hodge patent at that time upon the cars of their road?

A. They did not, as I understand it.

H. T. DOUGLASS.

Subscribed and sworn to before me this 1st November, 1862.

R. E. STILWELL,
U. S. Commissioner.

294 *Deposition of Samuel Blatchford.*

Q. 1. What is your name, age, residence, and profession or occupation?

A. Samuel Blatchford; age, 42 years; reside in the city of New York, and am an attorney and counsellor at law.

Q. 2. Were you ever employed as counsel for Henry Tanner in a patent suit against the New York and Erie Railroad Company? If yea, state when and in what case, and whether or not you wrote down the testimony in such case.

A. I was; in a suit brought by Tanner against that company for the infringement of a patent granted to him July 6th, 1852, as assignee of Bachelder and Thompson for an improvement in railroad-car brakes; that case was tried at Albany, in October, 1854, and I, as one of the counsel of Tanner in the trial, took down in writing minutes of all the oral testimony given on both sides at the trial.

Q. 3. Was Sarah A. Nichols examined as a witness in that case by the defendants on the part of the defence?

A. She was.

Q. 4. What did she testify to on that occasion in regard to her husband, Willard I. Nichols, making drawings for a car-brake in 1846?

A. I cannot from my recollections, unaided by the minutes of her testimony, which I then took down, state what she testified to on that subject; I took down accurately, as I believe, my minutes of what she did testify to; and having these minutes now before me, and reading from them, I state that she testified as follows in regard to 295 the point inquired of, the following being the whole of her testimony, both direct and cross, given on that trial, as taken down by me at the time:

"I resided in 1846 and 1847 in Hartford. My husband was Willard I. Nichols. His business was master mechanic on the Hartford and New Haven Railroad. I was acquainted with M'r Lepennse there, not with John Farnsworth. Lepennse was at work in the shop on patterns, under my husband. My husband died April 8th, 1850. I know of my husband drawing a plan, at home, of a brake for cars. I should think he drew that plan in the fall of 1846. That was a double brake, as he called it. I do not know of my husband's working on a brake. I know of his going off on a train of cars to try a brake after this. I can't tell the time; I think it was before March, 1847. The train went from Hartford to Springfield. I saw the drawing my husband made; he showed me how it operated.

"Cross-examined:

"I have not been told that if it should be established that my husband was the inventor I should derive some profit from the invention. My husband was sick in March, 1847. I think the brake was applied before that. He was sick most of the time till June, 1847. He left home in June, 1847. He had been sick some two months before. He was unwell at the time he invented it. I do not recollect any circumstance that would show the date more certainly. To the best of my recollection it was in 1846, late in the fall. It was quite cold weather. That drawing

was made at night. I was fearful of his injuring his health by
296 sitting up at night. He was more unwell after that till he was
confined to his house. I am not able to fix the time.

"Redirect:

"M'r Sayles told me I should have a handsome present in case plaintiff succeeded.

"Cross-examined:

"I think that conversation was the first time Sayles was at our house. I think it was a year this fall; I don't recollect. The suit was against the Hudson River Railroad Company. No such conversation took place when Tanner was present. He and Sayles were never there together but once; they inquired about the brake my husband got up. I think I told Tanner and Sayles that the brake was got up in the spring of 1847, and the drawing in 1846."

Q. 5. Did you ever draw the printed form of a bill in equity to be used by said Sayles in suits against railroad companies on said patent to said Tanner, and, if yea, do you know whether said printed form is the form used for the bill in this case?

A. I drew, at the request of M'r Sayles, and as his counsel, the form of a bill in equity to be used by him in suits against railroad companies on said patent, and I procured the said form to be printed; as printed, it covers eighteen printed pages, and has blanks left for the necessary written matter to enable it to be used for various suits. It refers to the patent to said Tanner, and the schedule thereto annexed as being annexed, and marked "A," and to a copy of a certified copy of the judgment-record of a judgment recovered by said Tanner against the New
York and Erie Railroad Company, in the circuit court of the
297 United States for the northern district of New York, Feb. 2nd,
1855, for $439.44, for the infringement of said patent, as being annexed and marked "D," and to a copy of a certified copy of the verdict of the jury on said trial, at Albany, in October, 1854, as being annexed and marked "C," and to a copy of a certified copy of an order made August 7, 1855, in said suit at law, denying a motion for a new trial therein, and to copies of two certificates signed severally by Eaton & Davis, and Thomas M. North, as being annexed and severally marked "E" and "F." I am informed that the said printed form is the one that was used for the bill of complaint in this suit.

Q. 6. Are the facts stated in said bill in question, prepared by you, true?

A. I believe everything stated in said printed form to be true; and I stated everything that is contained therein truly, I believe, so far as it was within my knowledge.

Cross-examined by M'r Whipple:

Cross-q. 7. Referring to your answer to the 2nd interrogatory, did you write down said testimony in full or only take notes or minutes of the same?

A. I did not write down any of the questions put to M'r's Nichols, and I suppose I did not write down every word that she said, and, therefore, what I did take down may, very properly, be called minutes or notes.

Cross-q. 8. Was it a matter of discussion and disagreement with the counsel in said New York and Erie case as to what M'r's Nichols did or did not testify to?

A. I do not recollect that it was.

Cross-q. 9. Have you not said that it was, since you have been
298 in this room? If not, please explain what you did say in relation
to this matter when looking over the minutes of her testimony, and thereupon deciding that in order to give a fair expression of her testimony it should be copied in full in your present testimony.

A. The discussion and disagreement of counsel was as to the effect of the testimony given as to the invention of Nichols, which, on the trial, included (if my recollection serves me) not only the testimony of M'r's Nichols, but the testimony of a man by the name of Lepennse; the counsel disagreed as to the date that ought to be fixed for Nichols' invention from the evidence in regard to it, taking it altogether; but I do not recollect any discussion or disagreement as to what, in fact, M'r's Nichols testified to.

Cross-q. 10. Were you, in December, 1860, examined as a witness in the case of Thomas Sayles vs. The Philadelphia, Wilmington and Baltimore Railroad Company, and have you consulted your testimony given in said examination in your deposition taken in this case?

A. I was so examined at that time in that case, and I have consulted such testimony in giving portions of my deposition in this case.

Cross-q. 11. "Upon said trial the said company gave evidence tending to prove that in the year 1843, at Springfield, in the State of Massachusetts, an eight-wheel platform-car was constructed, having two trucks of four wheels each, with a brake to each wheel, and a windlass to each end of the car; that the windlass at either end could operate all the brakes of both trucks, not by means of a centre vibrating lever, or any equivalent therefor, but by means of two chains winding around the
barrel of each windlass, one chain leading to and operating the
299 brakes of one truck, and the other leading to and operating the
brakes of the other truck, there being such an arrangement for each windlass, and each windlass having its own set of chains, connecting-rods, and levers throughout, independent of those of the other windlass; the brakes of the two trucks not being combined with the windlasses at both ends of the car by a centre vibrating lever, or in any other way, or connected with such windlasses, except as just described, and the brakes being connected by one windlass by one set of chains, connecting-rods, and levers, and with the other windlass by an entire different set of chains, connecting-rods, and levers, and there being two chains on the barrel of each windlass, so that if one chain gave way the other chain still remained operative, and that such arrangement of brakes was used on two platform crate-cars on the Western Railroad, in Massachusetts, during parts of the year' 1843 and 1844." Is this a part of your testimony in the case referred to?

A. It is.

Cross-q. 12. And did the plaintiffs respond as follows: "In reply to that evidence the said Tanner introduced evidence tending to prove that in such arrangement of brakes the two chains on the windlass would overlap on each other on being wound upon the barrel, and that, in consequence thereof, and in the passage of the truck from a straight line to a curved part of a railroad, and vice versa, the action of the brakes would be unequal in consequence of the different lengths of the two chains on each windlass, accompanied by a tendency either to break the short chain or throw the wheels from the rails, or destroy the free swiveling action of the trucks, and that the combination in such ar-
rangement was different from that described and claimed in said
300 letters patent in the brake-levers in the two trucks was not con-
nected together, except at the windlasses, except by being combined together by means of the centre vibrating lever?"

A. He did.

Cross q. 13. What disposal, if any, has been made of the case in question?

(Objected to.)

A. I only know from hearsay; I have been told by M'r Sayles (the plaintiff in it) that it has been discontinued by him.

Direct resumed:

Ques. 14. Was or was not James M. Hebard and John Stockbridge examined as witnesses in the New York and Erie case in October, 1854?

A. I have no recollection that either of such persons were examined as a witness on that trial; and on consulting my minutes of the trial I do not find it stated that either of such persons was examined either orally or by deposition; if either of them had been examined my minutes would show the fact.

Cross resumed:

Cross-q. 15. Did you, in the deposition already referred to, testify as follows: "The result of the trial was, that the jury found a verdict for said Tanner for seventy-five dollars damages; that amount was agreed upon by the counsel for the respective parties, as the amount in which the jury should find for the plaintiff if they should be of opinion that they should be entitled to recover"?

A. I did.

301 Cross-q. 16. What means have you of knowing that the facts in the bill referred to by you are true?

A. My connection with the litigation upon the patent, and its progress, as counsel for M'r Tanner and M'r Sayles, and as inspector of the written documents referred to in the bill.

SAMUEL BLATCHFORD.

Subscribed and sworn to before me this 1st November, 1862.

R. E. STILWELL,
U. S. Commissioner.

Deposition of A. Emigh.

Q. 1. What is your name, age, residence, and occupation?

A. Asahel Emigh; 38 years of age; reside in the city of New York, and am engaged in patents.

Q. 2. Are you familiar with the patent for car-brakes as granted to Henry Tanner, July 6, 1852? If yea, please state what railroads, if any, you have known the same to be in general use and what roads in partial use upon?

A. I am familiar with said patent. I have known it in general use upon the Providence, Hartford, and Fishkill, Providence and Stonington, the Camden and Amboy, New Jersey, Jamestown, the Belvidere, the Lehigh Valley, the Augusta and Savannah Railroad, the Georgia Central, Montgomery and Florida, Mobile and Grand, the New Haven, Hartford and Springfield Railroads; in partial use on the Providence and Worcester, Boston and Providence, Staten Island, the North Pennsylvania, Pennsylvania Central, the Richmond and Fredericks-
302 burgh, the Wilmington and Manchester, the Selma and Alabama
River Railroads, the Reading Railroad, the Hudson River, New York and Erie, Buffalo and New York City, Elmira, Canandaigua and Niagara Falls Railroads.

Cross-examined by M'r Whipple:

Cross-q. 3. What fact or circumstance has led you to be familiar with the use of railroad car-brakes?

A. I was formerly employed as agent for Henry Tanner, in the year 1854 or 1855, for the sale of the Tanner patent car-brake; from 1855 to the present time I have been employed partially as agent and partially as owner of what is known as the Stevens patent car-brake. Under such agencies and ownership I have visited most of the railroads in the United States for the purpose of learning what plans of brakes were in use on the various roads, and to introduce and sell the rights under the aforesaid patents.

Cross-q. 4. Have the railroad companies upon whose roads you state the centre lever-brake, or Tanner brake, so called, is in general use, a license to use said brake under said patent?

A. I have been informed by the officers of a number of the roads that they had a license to use the Tanner brake.

Cross-q. 5. Have such roads a license to use the Stevens brake?

A. Not to my knowledge, from the best of my recollection.

Cross-q. 6. Would they be likely to have a license and you not know it?

A. Not likely; but such, however, might be the case.

303 Cross-q. 7. You speak of the centre lever being in general use on the New Haven, Hartford, and Springfield Railroad. At how early a date are you knowing to its use on that road? Please state from what year.

A. According to my recollection it is about 1856 or 1857 that I first saw it in use on that road.

A. EMIGH.

Subscribed and sworn to before me this 1st day of November, 1862.

R. E. STILWELL,
U. S. Commissioner.

Deposition of Gorham P. Fields.

Q. 1. What is your name, age, residence, and occupation?

A. Gorham P. Fields; reside on Green Island, Albany County; am 39 years of age; work in car factory of Uri Gilbert, as foreman in the car-shop; have been there since 1851.

Q. 2. Were you ever in the employ of the New Haven, Hartford, and Springfield Railroad Company; if yea, when, and for how long time?

A. I was. Commenced work in 1845, and left in May, 1848, between the first and fifth of May. I worked on the repair of cars in that time. Commenced under W'm Clayton as foreman, and finished under Willard I. Nichols as foreman.

Q. 3. How long did you work under Willard I. Nichols as foreman?

A. From the fall of 1845 to May, 1848.

304 Q. 4. While you were at work there did said Nichols have a long baggage-car built for that company; if yea, when was said car completed?

A. He had a car built, but I couldn't tell when it was finished. I mean a long baggage-car. I should think it was finished in the spring of 1848, to the best of my judgment; I cannot tell positively. I worked on the car considerable. Think I worked on it in 1847 and 1848. Think some of work was done during the last year I worked there.

Q. 5. What kind of brake was put on said car?

A. It was a double-acting brake, with a central lever, in the centre of the car. I never saw one of the kind before.

Q. 6. Did M'r Nichols superintend the putting of that brake on that car?

A. He did. They had some trouble in the first place. The lever was too long or too short, I don't know which. I remember we had to take it off and have it altered. The connections were not right. We had to alter them several times. I recollect taking them off once myself.

Q. 7. Was that the first time Nichols put that brake on a car?

A. It was the first time I ever saw him put one on. Should think, from his actions, it was the first he ever put on. It was the first one that was on, on that road.

Q. 8. Do you recollect whether that car was completed about the time you left the road or not?

305 A. I am not positive, but should think it was; that is the best of my recollection. I recollect John Stockbridge was there when I left.

Q. 9. Did you know the widow of said Nichols?

A. I did.

Q. 10. Did you ever call at her house, or store, at Cohoes, N. Y., to get an account-book formerly kept by her husband at Hartford, C't, when you were there?

A. I did not. I have seen the book and looked it over; she brought the book to me at Eaton & Gilbert's shop, and wanted me to look it over and see if I could tell when her husband put the brake in question on the car. This was the day-book her husband kept at Hartford when I was there; she brought it to me about eight years ago.

Q. 11. Was the baggage-car you speak of the only car of that class built by said company while you were there?

A. It was.

Cross-examined:

Cross-q. 1. Do you know anything about the application of said brake to an old car in the old paint-shop of James M. Hebard, under the directions of said Willard I. Nichols, in the winter of 1846 and 1847?

A. I do not.

Cross-q. 2. Are you certain as to facts and dates to which you have testified in your direct examination?

306 A. I am, except so far as qualified therein.

Cross-q. 3. Who claimed the invention of said brake?

A. Willard I. Nichols.

Cross-q. 4. Was James H. Hebard at work on car-repairs in winter of 1846 and 1847?

A. He was. I cannot say that he was all the time; but he was a part of the time.

GORHAM P. FIELDS.

Subscribed and sworn to this 3rd day of Nov., 1862.

M. BEACH,
U. S. Commissioner.

307 APPLICATION OF BATCHELDER AND THOMPSON.

THE UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, greeting:

This is to certify that the annexed are true copies, from the files and records of this office, of all the papers and correspondence, except of the patent as granted in the matter of the application of L. F. Thompson and A. G. Batchelder for a patent for an "Improvement in railroad-car brakes," filed on the 29th day of June, 1847; in accordance with which application letters patent were issued to Henry Tanner, assignee of the said Thompson and Batchelder, on the 6th day of July, 1852.

In testimony whereof I, Charles Mason, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this 16th day of January, in the year of our Lord one thousand eight hundred and fifty-four, and of the Independence of the United States the seventy-eight'.

[SEAL.] C. MASON.

To the Commissioner of Patents:

The petition of L. F. Thompson, of Charlestown, mechanic, and A. G. Batchelder, of Lowell, carriage-maker, both of the county of Middlesex, State of Massachusetts, respectfully represents that they have made an improvement upon the car-brake now in general use, which they verily believe has not been known or used prior to the invention thereof by your petitioners. They therefore pray that letters patent of the United States may be granted to them thereof, vesting in them and their legal representatives the exclusive right to the same upon the terms and conditions expressed in the act of Congress in that case made and "provided," they having paid thirty dollars into the Treasury, and complied with other provisions of the said act.

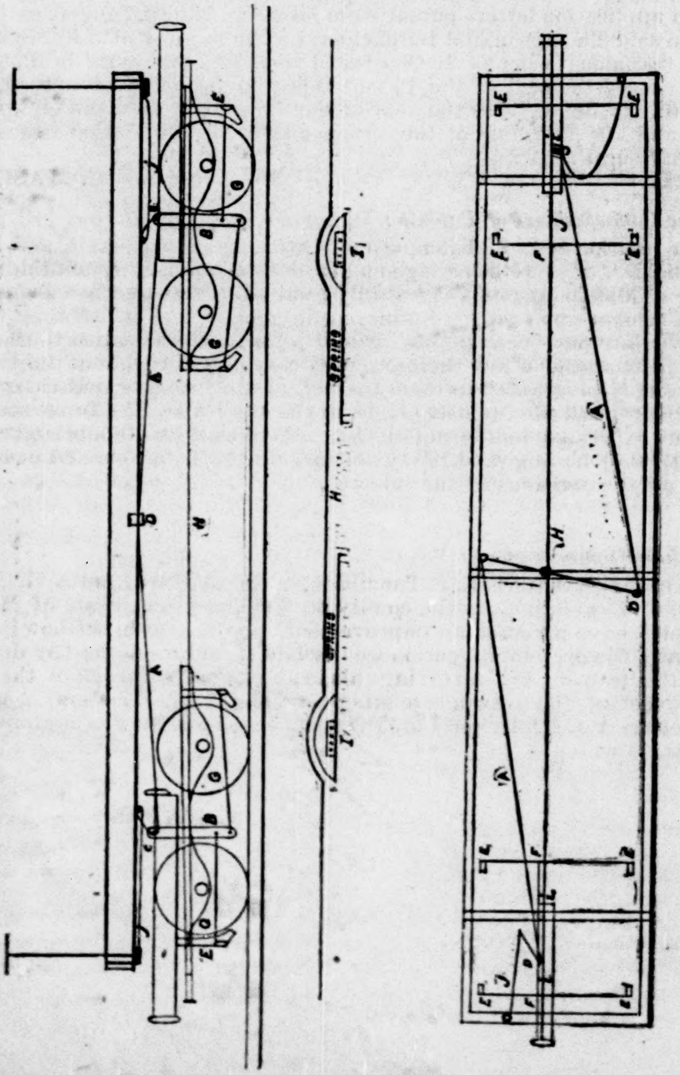
To whom it may concern:

Be it known that we, L. F. Thompson, of Charlestown, and A. G. Batchelder, of Lowell, both in the county of Middlesex and State of Massachusetts, have invented an improvement upon the car-brake now in general use (the original invention we disclaim); and we do hereby declare that the drawing accompanying this is an exact description of the said improvement, the drawings making part of this specification, in which the letters A, C, D, H, and I are the parts which we claim as our improvements, in which—

308 **[THE DRAWING.]**

A represents the connecting-rods of the brakes; these rods are attached to the top of lever B, one end, and the other to the end of lever D.

THOMPSON AND BATCHELDER.



[N. B. The above represents the original drawing and the writing upon it.]

B represents the levers attached to the brakes; they are attached to the connecting-rods at the top and to the rods G at the bottom, which are attached to the bars that connect the brakes.

C, the point where the connecting-rods are attached to the brake-levers, and where the brake-levers unite with the butters by means of a gain.

D represents the lever, which is attached to a cross-bar in the centre by a pivot, and the connecting-rods at the end.

E represents the brakes, which "bear" upon the outer edge of the wheels when pressed by the lever B; they are connected by the bar F.

F represents the bar that connect the brakes.

G, short rods, connecting the bars F with the lever B.

H represents a rod running the length of the carriage under the butters, to throw off the brakes (by means of an arm attached to the tender) at pleasure. This is done by means of gains or "bends" fitted to knobs which are attached to lever B. By "forcing" the rod either way it crowds the lever out of the gain and disconnects it with the butter.

I represents the knobs fitted to the bends in the rods H; they are attached to springs which keep them in the bends of the rod, unless forced out by moving the rod either way.

J is a purchase attached to the connecting-rods, by which the brake may be applied by hand at pleasure, without reversing the engines.

Cancelled.

309 The operation is thus: while the engine is attached to the cars the engineer can operate on the brakes throughout the whole train, by slacking the speed of his engine and bringing it back against the butter, and so applying the power to the levers B. To reverse the motion of the cars, an arm (which is attached to the tender) is thrown out so as to meet the rod H, and thus throwing the bar B out of the gain in the butter, throughout the whole train. When the engine is detached, one brakeman is sufficient to do the work of any number of cars.

What we claim as our improvement, and desire to secure by letters patent, is the application to car-brakes to prevent collisions, &c., &c.

LA FAYETTE F. THOMPSON.
ASAHEL G. BATCHELDER.

Witness:
IONA MARSTON, J'r, to L. F. Thompson.
Witness:
NATH'L HEATH, for A. G. B.

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

LOWELL, *June 22d*, 1847.

On this twenty-second day of June, 1847, before the subscriber, a justice of the peace in and for the said county of Middlesex, personally appeared the within-named Asahel G. Batchelder and made solemn oath that he verily believes himself and the within-named La Fayette F. Thompson to be the original and first inventors of an improvement upon the car-brake now in general use, as within described, and that he does not know or believe the same was ever before known or used, and that he is a citizen of the United States.

WILLIAM A. RICHARDSON,
Justice of the Peace in and for said County.

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

CHARLESTOWN, *June* 22, 1847.

On this twenty-second day of June, A. D. 1847, before the subscriber, a justice of the peace in and for said county of Middlesex, personally the within-named La Fayette F. Thompson, and made solemn oath that he verily believes himself and the within-named Asahel G. Batchelder to be the original and first inventors of an improvement upon the car-brake now in general use, as within described, and that he does not know or believe the same was ever before known or used, and that he is a citizen of the United States.

GEO. FARRAT,
Justice of the Peace.

Pencil-notes made at the Patent Office.

The specification and drawings are very defective. The specification does not describe the nature, construction, or operation of the 310 alleged improvement. The claim "is the application to car-brakes to prevent collisions, &c., &c." The claim must be clear and specific. The claim here set up would cover every kind of car-brake. The drawings do not illustrate the operation of the brake. There must be more carefully prepared specifications and drawings furnished before this case can be considered, but this must be returned to the office without erasing these pencil-notes. There is also an omission in the oath. There must be two witnesses to each signature. See enclosed circular.

CHARLESTOWN, MASS., *Dec.* 9, 1847.

To the Commissioner of Patents:

Please stay any further proceedings in the case of the application of us for the patent of Thompson and Batchelder's improvement on the car-brake, as we wish to make some further improvement. The application was made by Att'y N. Heath, and the model deposited by him, June 26th last past, with H. H. Sylvester, esq.

Your ob't serv'ts,
THOMPSON AND BATCHELDER,
Per NATH'L HEATH.

BOSTON, *Oct.* 4, 1850.

SIR: Herewith I send you for record the assignment of L. F. Thompson and A. G. Batchelder to Nath'l Heath. Please charge the same to me.

Yours, respectfully,
R. H. EDDY.

THO'S EWBANK,
Com'r of Pat's, Washington, D. C.

To the Commissioner of Patents:

SIR: About June 26, 1847, the papers of the application of L. F. Thompson and A. G. Batchelder were filed in the Patent Office. Please return them by mail to M'r R. H. Eddy, who is my attorney in the case, the application having been assigned to me.

NATH'L HEATH.

Ans'd Oct. 9th, 1850.

PATENT OFFICE, *Oct.* 9, 1850.

SIR: Specification and drawings of Thompson and Batchelder's car-brake, assigned to N. Heath, are herewith forwarded to you, in accordance with the request of the latter contained in your letter of the 4th inst.

Yours, respectfully,

THO'S EWBANK,
Com'r of Patents.

R. H. EDDY, *Boston, Mass.*

311 BOSTON, *July* 10, 1851.

SIR: The accompanying specification and drawing of Thompson and Batchelder's application was sent me by you some time ago. They are herewith returned, and may be again placed on file.

Yours, respectfully,

R. H. EDDY.

R. C. WEIGHTMAN, Esq.,
Acting Com'r of Patents, Washington, D. C.

BOSTON, *Sept.* 10, 1851.

SIR: Mess'rs Thompson and Batchelder, by their attorney (then) N. Heath, filed, in 1847, an application for a patent for a car-brake.

They inform me that in the fall of the same year they requested proceedings stayed. That subsequently they wrote to the office several times in relation to the examination, but never received any reply.

They now respectfully request that their application may be examined and the result reported to me.

Yours, respectfully,

R. H. EDDY.

P. S.—I believe there is a letter from them on file making me their agent in the case.

THO'S EWBANK, Esq.,
Com'r of Patents, Washington, D. C.

Ans'd Oct. 17, 1851.

PATENT OFFICE, *October* 17, 1851.

GENTS: Specification and drawings of your alleged improvement in railroad-brakes are herewith returned for entire insufficiency. The office, from what it can learn of the case, cannot encourage you, however, to press the application further.

Yours, respectfully,

THO'S EWBANK,
Com'r of Patents.

THOMPSON and BATCHELDER,
Care of R. H. Eddy, Boston, Mass.

To the Commissioner of Patents, Washington City, D. C.:

Please allow W. P. N. Fitzgerald, esq., to withdraw one of my original drawings from the Patent Office, which were deposited by us in our application for patent for a R. R. brake in 1847, and which we 312 subsequently assigned to H. Tanner, of Buffalo, or do all and everything in the premises which we could do if present.

LA FAYETTE F. THOMPSON.
ASAHEL G. BATCHELDER.

To the Commissioner of Patents, Washington City, D. C.:

SIR: Please allow W. P. N. Fitzgerald, esq., to withdraw any drawings from the Patent Office which may be there as first drawings in the application of Thompson and Batchelder for letters patent for R. R. brake, which was subsequently assigned to me, as fully as I could do in any case, if present.

H. TANNER.

BOSTON, *April* 13*th*, 1852.

SIR: Herewith I send you the original specification and drawings of the case of Thompson and Batchelder.

I also send you an amended specification and drawings in accordance with the pencillings on the original.

I also send you Nath'l Heath's assignment to Thompson and Batchelder, A. J. Bellows' assignment to Thompson and Batchelder, and Thompson and Batchelder's assignment of the invention to Henry Tanner.

You will thus see that the whole now stands in the name and possession of Henry Tanner, I being his attorney in the case. Please put the assignments on record at my expense.

I also return to you, not amended, the specification for the reissue of the patent of Charles B. Turner, assigned to Henry Tanner. To the said specification you will find appended (by wafer) a piece of paper, on which is written the claim that, I understand from M'r Tanner, the Patent Office was willing to allow him previous to the discovery of the pending application of Thompson and Batchelder.

There will be no necessity for a declaration of interference, as both applications are now in the name of M'r Tanner. The claim in the Thompson and Batchelder application has been made to correspond with that suggested on the paper appended to the Turner specification.

The inquiries made by M'r Tanner have led him to believe that the invention of Thompson and Batchelder was made prior to that of Charles B. Turner.

He, therefore, is willing to withdraw his application for a reissue of the Turner patent, provided you decide to grant the patent of Thompson and Batchelder.

In case you order the latter to issue, you may return the original patent of C. B. Turner.

Yours, respectfully,

R. H. EDDY.

THO'S EWBANK, Esq.,
Com'r of Patents, Washington, D. C.

313 The oaths of Batchelder and Thompson to their amended specification.

STATE OF MASSACHUSETTS,
County of Middlesex, ss:

On this 8th day of April, A. D. 1852, personally appeared before me the above-named Asahel G. Batchelder and made oath that he does verily believe himself and La Fayette F. Thompson above-named to be the original and first inventors of the improvements above specified; that he does not know or believe the same to have ever been known or used before their invention thereof, and that they are citizens of the United States of America. The words "LaFayette F. Thompson" and "themselves" and "they" were erased by me; and the words "himself" and "La Fayette F. Thompson above-named" and "he" were all altered and interlined by me before administering said oath.

DANIEL T. RICHARDSON,
Justice of the Peace.

STATE OF NEW HAMPSHIRE,
County of Sullivan:

On this 10th day of April, A. D. 1852, personally appeared before me the above-named La Fayette F. Thompson and made oath that he does verily believe that he and the above-named Asahel G. Batchelder are the original inventors of the improvements above specified; that he does not know or believe the same to have been ever known or used before the invention thereof, and that they are citizens of the United States of America.

P. C. FREEMAN,
Justice of the Peace.

PATENT OFFICE, *April* 30, 1852.

SIR: In accordance with the request contained in M'r Eddy's letter of 13th instant, the old patent in the case of application for reissue of C. B. Turner's car-brake is herewith returned to you. There is an entire difference of arrangement in the details of the model and drawings belonging to the application of Thompson and Batchelder, which should be removed by the substitution of either new drawings or model. The case is, in consequence, postponed until further advices from you.

Yours, respectfully,

THO'S EWBANK,
Com'r of Patents.

HENRY TANNER,
Care of R. H. Eddy, Boston, Mass.

314 To the Com'r of Patents:

SIR: Please forward the patent of Batchelder and Thompson, for R. R. brake, assigned to me (when issued), to R. H. Eddy, esq., of Boston, Mass.

H. TANNER,
Buffalo, N. Y.

WASHINGTON, *18th June*, 1852.

No. 9009. L. F. Thompson and A. G. Batchelder, assignors to Henry Tanner, of Buffalo, N. Y.

Town of Charlestown and Lowell. County of Middlesex, State of Mass.

Imp'd car-brake (brake).
Rec'd June 26, 1847.
Petition, "
Affidavit, "
Specification, "
Drawing, "
Model, "
Treasurer's certificate.
Cash $30, June 26, '47.
Examined, Cooper, June 18, 1852.
Issue, R. C. W., June 19, 1852.
Patented July 6, 1852.
Recorded vol. 49, page 48.

(Objected to by plaintiff.)

Ans. I never did, that I know of.

319 Cross-examination by M'r Thomas Sayles, the plaintiff:

I can't swear that the model entire is correct in all its proportions, but the principle of the thing is there.

Direct examination resumed:

By the "principle of the thing," I mean the brakes as they are connected and operated in the model A.

Cross-examination resumed:

I mean in the last answer the general arrangements of the brake without reference to the proportions of the brake.

HENRY H. SNOW.

The deposition of EMERY STEBBINS, taken before the said Elias Merwin, on behalf of the defendant, on the 19th day of September, A. D. 1862.

My name is Emery Stebbins; age, thirty-six years; residence, Springfield, Mass.; and I am car inspector on the Western Railroad, at Springfield. I have been in the employ of the road twelve years, part of the time in the wood-shop, on repairs.

I know of the use of a brake on the cars of the Western Railroad similar to that represented in the model now before the commissioner, marked "Model A, E. Merwin, U. S. C." We first used it on number 2 car of the Western Railroad—that was the number of the car. It was a passenger-car. I should think it was about six years ago that we first put it on this passenger-car, about the year 1855 or 1856, and it was used about two years, I think, on that car at that time. It was 320 put on to what line of cars we had soon after that, on all the cars on the express line between New York and Boston. It was put on to twenty-two or twenty-four cars, passenger and baggage, at that time. They were on about sixteen months; it was over a year, I know.

All the difference between the brake exhibited, the model, and the brake which was applied to those twenty-two or twenty-four cars, was, that in the brakes of these cars but one chain wound round the windlass, and that chain was attached to the upper end of the lever in the first truck, and a rod attached to the same point connected it with the upper end of the lever with the second truck, and the same may be said of the attachment at the other end of the car. The reason why we put it on in this way, getting rid of the second chain, was, it saved us the trouble of altering the windlasses; but it didn't make it any better.

This brake applied the brakes simultaneously to both trucks and from either end of the car. I operated these brakes while switching the cars. I call it a good brake when it was in order. It was no more liable to get out of order than other brakes.

I am acquainted with the centre lever or Tanner brake. I think you can apply the power to the trucks as well with the brake shown in this model as with the centre lever or Tanner brake, and at either end of the car.

Cross-examination by M'r Thomas Sayles, the plaintiff:

I never operated the Tanner brake or the Springfield brake out on the road, no other way than switching in the yard

I know why these Springfield brakes were put on the express-line cars. When the express-cars were built, the Hodge brakes were put on

321 to the cars and on to the road, and the Western Railroad did not own the right to use them; and that is the reason why the Hodge brake was ordered off and these were ordered on and were put on. I don't know whether Hodge commenced a suit or not. I don't know why this brake was not continued on the cars, but I think some compromise was made by which the right to run Hodge's brake over this road was obtained. The Hodge brake was put back after this brake had been running sixteen months. This was abandoned after running some sixteen months, and the Hodge brake was put back again on these twenty-two or twenty-four cars.

The levers in the express-line cars were arranged the same as in the model, except that in the express-cars the short arm of the first truck lever set on the connecting rods of the brake, operating from the other end of the car. The operation was just the same, and the result was just the same.

The bottom end of the truck-lever set in a slot on the connecting rod, with a pin through it so as to hold it permanently in that place, instead of being attached to the break' bar. The result would be just the same in either case.

The break' we had on the Western car was precisely like the one in the model. That has been removed, and the single break' put on in its place. The Springfield break' was on this car two or three years. I should think it was put on the last of 1855, or the first of 1856—about that time; I think it was the last of 1855.

Direct examination resumed:

The general brake now in use on the Western Railroad is the single break', and always has been since the opening of the road, so far as I know.

EMERY STEBBINS.

322 The deposition of WILSON EDDY, taken before the said Elias Merwin, on behalf of the defendant, on the 19th day of September, A. D. 1862.

My name is Wilson Eddy; age, forty-nine years; residence, Springfield, Mass., and I am master mechanic of the Western Railroad, and have been connected with that road, as foreman of the shop and master mechanic, for the last twenty-two years.

In December, 1840, we had a severe accident here in Springfield, owing to the deficiency of brakes, by an engine and train coming down this grade. The engine and train were badly smashed up, and four men lost their lives. When this engine and tender was repaired, and before it was put upon the road again, there were brakes put on both trucks of the tender. They are operated both from one windlass by a connecting rod running from the top of the lever on the first truck to the top of the lever on the rear truck. The lever of the first truck was operated by a windlass the same as the single break' and the same as if the rear truck hadn't been connected with it. This tender went out of the shop in the spring of 1841, I think in April. M'r Ephraim Harris got up this brake, made it and applied it to the tender. This brake has been used from that time constantly on the tenders on this road, and is the one now in general use on our tenders.

The break' shown in the model now before the commissioner, marked "Model A, E. Merwin, U. S. C.," was got up and applied to two crate-cars by M'r Harris, in 1842 or 1843, according to the best of my recollec-

tion. It was in use on those cars as long as the cars were in use,
323 which was some two or three years; I can't recollect the time exactly.
When the cars went out of use, the necessity for the double brake went out with them.

I understand that this brake applies the power of the brakeman simultaneously to the brakes of both trucks and at either end of the car.

Cross-examination by M'r Thomas Sayles, the plaintiff:

I should think that this brake, shown in the model A, did not apply the brakes equally when on a curve and on a straight line; but it will do so as nearly as a single brake.

I mean to say that this model is the same in all its essential parts as the one applied to the crate-cars. I would not say positively that some of these levers were not in a little different position, and I am inclined to think that the truck-lever was between the windlass and the outer or front end of the truck-frame. I should not think the crate-cars were used when the river at Albany was frozen over. I can't say that I ever worked these brakes myself.

Direct examination resumed:

I know that the Springfield brake, as shown in model A, was essentially the same as the one which was put on the express-line cars running from Boston to New York. I recollect that there was but one chain went around the windlass, and the lever of the truck at the other end of the car was connected the same as I have described in the tenders. The car was broke by the same apparatus from either end of the car.

Cross-examination:

This brake was some time after taken off the express-line cars
324 and the Hodge brake was put back. I can't tell how long this
brake was on. I do not know why this change was made.

Direct examination:

I was acquainted with M'r Willard J. Nichols when he was in the employ of the Western Railroad, and I know that he was acquainted with the existence and use of the Springfield brake. I know that the subject of brakes was frequently up and discussed, and that M'r Nichols had the repairing of this brake.

WILSON EDDY.

The deposition of FERDINAND LEPPENS, taken before the said Elias Merwin, on behalf of the defendant, on the 19th day of September, A. D. 1862.

My name is Ferdinand Leppens; age, forty-six years; residence, Hartford, Conn.; and I am now master mechanic of the Hartford and New Haven Railroad, in the car department.

I was acquainted with Willard J. Nichols, who is now deceased. I became acquainted with him in March, 1846. He then occupied the same position that I now occupy. In the fall of that year we had occasion to build what was then called an extraordinary length baggage and second class car. (I was then connected with the Hartford and New Haven road as pattern-maker.) To that car we attached the Nichols brake, which is represented in the model now before the commissioner, marked "Model B, E. Merwin, U. S. C., Nichols Brake." I suppose M'r Nichols invented this brake. He introduced it to me as his brake, and it was the first knowledge I ever had of any double-acting brake.

325 I remember about the time when the car was running with this Nichols brake attached from this circumstance: the brakeman observed to me that he thought that they did not hold as well as when he used the single brake, for this reason, that the snow got in between the brake-clog or block and the wheel. It was early in March, I think, that this was running.

I think it was early as March or April, 1847, that this long car was running with the Nichols brake attached. I think it must have been as early as March.

Int. Are you positive that it may not have been as early as January or February that the car came out?

(Interrogatory objected to by the plaintiff.)

No; I am not positive.

M'r Nichols came into the shop early one morning and brought with him a stick about six inches long, with four strings attached to it, to each end of the stick. He laid this stick on my bench, and showed me the application of this stick and strings to the truck-levers with chalk. That he marked out on the bench, and asked me if I thought it would work. I told him certainly it would. This stick and the strings attached represented the centre lever, and the rods attached to the windlasses and brake-levers, the same as seen in the model B already referred to.

I cannot tell whether this was one, two, or three months before the car was run out. It might have been one month and it might have been three months. I will not say positively that it was not more than three months before the brake was applied to the car; I should think it wasn't more than three months. I didn't apply it myself; I was there when it was applied.

326 I do not remember of M'r Nichols presenting the brake to me in any other way than by the stick and strings, as already described.

The brake-lever in the trucks of the Nichols brake was first applied to the outside of the end timber of the truck, as seen in Figure 6, in the cut of Tanner brake hereto annexed, marked "Exhibit E, E. Merwin, U. S. C."

It was afterwards applied on the inside of the brake-bar, as seen at D, in Figure 15, Hodge brake, in "Exhibit E, E. Merwin, U. S. C.," and finally as seen in the model aforesaid now before the commissioner, already referred to, and marked "Model B, E. Merwin, U. S. C., Nichols Brake."

The lower cut in Exhibit E is a correct representation of the Hodge brake in all its essential points. The Hodge brake was first applied to a car on the Hartford and New Haven road in June, 1849. I can't say positively, but I should think it run a year on that car, and perhaps more. We then took it off and put the Nichols brake in its place.

I am slightly acquainted with Henry Tanner. I can't say positively, but I think my acquaintance with him began as early as 1849. My impression is that he was around about the same time that M'r Hodge was there attempting to introduce his brake. I knew he was there at different times. I know he was there in 1851. In 1851 he knew of this Nicholas brake. He knew it then as well as I knew it. I have seen a bond which M'r Tanner executed to John Durand in trust for the widow of the said Nichols in 1851. I saw the bond recently. I saw it in the office of the secretary of the Hartford and New Haven road day before yesterday. M'r Tanner told me that if he substantiated his claim to the Turner brake, he would pay M'r's Nichols a handsome sum.

327 He never told me that he had executed a bond for her benefit. I knew of the execution of such a bond through M'r Durand, and I understood it was on account of the Nichols brake. I supposed that Tanner didn't want anything more said about the Nichols brake than he could help until he established his claims to the Turner brake.

Cross examination by M'r Thomas Sayles, the plaintiff:

When M'r Nichols first showed me the stick and strings, as illustrating the brake, he showed it to me as a novel invention of his own—one that he had just got up. He didn't show me any drawings. He never said anything to me about any drawings.

I know nothing of my own knowledge about M'r Tanner having given a bond to M'r Durand for the benefit of M'r's Nichols, except as I have already stated. I have seen a bond with the name of Henry Tanner attached to it, but I cannot swear that it was his signature.

Direct examination resumed:

M'r Nichols represented to me, when he showed me the stick and strings, that it was something recent—that he had conceived it the night before.

[It was not M'r Nichols' habit, as a general thing, of communicating his ideas as to what he wanted to have done by sticks and strings, instead of a regular drawing. A regular drawing was the usual course.]

The clause in brackets objected to by the plaintiff.

FERDINAND LEPPENS.

328 The deposition of SARAH A. ALLEN taken before the said Elias Merwin, on behalf of the defendant, on the 19th day of September, A. D. 1862.

My name is Sarah A. Allen; age, forty-six years; residence, Waterford, New York. My name was formerly Sarah A. Nichols, and I was the wife and widow of William J. Nichols, now deceased.

I formerly resided with my husband, M'r Nichols, in Springfield, Mass., until my fourth child was born, which was in the year 1845. I had always resided in Springfield up to that time.

My child was born the 12th April, 1845, and about a fortnight afterwards my husband went into the employment of the New Haven and Hartford Railroad Company. Their shop was then at New Haven, and he went there as master mechanic.

He took the place of M'r William Clayton, I think his name was. We removed to Hartford the first of December of the same year. I do not think the Hartford shop was then finished. My husband for a month was obliged to be at New Haven before the shop was finished at Hartford. We moved to Hartford on a Saturday. M'r Nichols went down to New Haven on Monday, and came back sick on Tuesday. He was sick several days. After he recovered a little he used to get his paper out and draw to divert himself, as I supposed. Then he didn't do anything at the drawing again that I recollect of until the shops were moved up to Hartford. He then used to draw often, afternoons when he had a little leisure, but oftener Sundays. He mentioned to me that it was a brake that he was a-drawing, but I didn't inquire into it and didn't understand what he was drawing.

329 The first I ever saw M'r's Leppens, although I think I had seen M'r Leppens, they called at our house. They had been out walking. I think the weather must have been quite settled. I cannot tell the month, but think it must have been in the spring. This was on Sunday that they called. After sitting awhile M'r Nichols asked M'r

Leppens to look at the drawing which lay on the table in the room where we were sitting, and asked him what he thought of it. M'r Nichols showed him this drawing. I supposed it was of a brake. M'r Leppens pointed to some part of the under part of it. I didn't hear the answer, but M'r Nichols explained something about it which I didn't understand. They stood and talked together about it some time. I recollect the circumstance particularly, from feeling mortified at the time that he should tell strangers that he worked on Sunday, and I said to M'r's Leppens, this is good work for Sunday.

This was in the spring of 1846, the first spring after we went to Hartford.

My husband had frequently shown me the drawing before this. I presume I had seen it every day. It lay on the table. What I recollect about it is, there were some straight lines, and some machinery I think under them. There was another drawing on the same paper, which represented, as I understood, the brake in a different way. On the paper, whether connected with this or not, I don't know, there was drawn what he called a scale. It was drawn on this same paper, at the left-hand corner. This paper was on a drafting-board—a board he made himself and called his drafting-board—and was tacked down with what he called drafting-tacks or nails. This was the drawing which he showed to M'r Leppens on the occasion above stated. M'r Nichols often explained it to me as a brake, and said that it would dispense with one-half the brakemen. I didn't understand then how it would, and I don't now.

330 This drawing was in the house some months before he carried it out. I should think it was in the house at least six months from the time he began on it before he carried it out. He said he was going to carry it to the shop when he carried it out, and I have no reason to doubt his word. He showed it to me as he carried it out, and I said to him I thought it would be much use to him. I had often laughed at him for spending so much of his time on it nights and Sundays. I supposed he was taking it over to the shop to show it to the men. When I said to him I hoped it would be of much use to him, he said, use or no use, if I had the means, I wouldn't do another day's work for a living. When he came home, I asked him what the men thought of his drawing, and he said they thought it was a good thing. I often asked him when he was going to put that brake on a car, and he said when we get time. When the car came out with it on, he asked me to come out on to the piazza and see it. He said he was going to Springfield with that car. I made the remark to him, that I guessed the car would run if I didn't come out and see it. The car to which this brake was applied was a baggage car. I did go out and see it, but I didn't know where the brake was, nor where to look for it. I knew the wheels on top they called the brakes, but how they applied them I didn't understand; of course I knew that the brake was somewhere down near the wheel. When he returned, he asked me if I see it. I asked him how I could see it when I was standing higher than the car. I told him I saw him and I thought he was a very careless man. He was standing on the bottom step of the car, holding on by the rod, and looking under the car. He had an overcoat on. He was in the habit of wearing an overcoat very much, whenever it was damp or chilly weather, even in the summer a good deal. His health was very poor.

331 I remember it was warmish weather when he carried the drawing out of the house to the shop, as already stated, although I cannot tell the month. I know the windows and doors were open when

he brought it down and carried it out, and that he didn't have any overcoat on. I cannot tell when the car with this brake on came out, whether it was in the fall of 1846, or in the spring of 1847. I think it was between that time; I think it was previous to first of April, 1847, and I know it was previous to the first of May, 1847. I know from the state of my own health from delicacy, that it could not have been as late as May when I went out on the piazza and saw the car, as I have before mentioned. My little girl was born in June, 1847.

I suppose the drawing was in a finished state, or nearly so, when he showed it to M'r Leppens, in the spring of 1846, soon after our acquaintance with M'r Leppens. He worked on the drawing some afterwards. It was some days or weeks before he took it to the shop that he didn't draw on it, to my knowledge. He may have done it and I not know it.

I supposed, until yesterday, that this drawing was in existence, and that M'r Leppens had it. After M'r Nichols died, in the year 1850, I asked M'r Leppens to take charge of M'r Nichols' tools and things which he had over to the shop and dispose of them for me, and he did so. They were disposed of, and I always supposed that this drawing was among the things till yesterday, and that M'r Leppens took it.

I am not much acquainted with Henry Tanner. He called at our house with M'r Sayles, the plaintiff, at Cohoes, New York. They then had some suit with some railroad company. M'r Tanner said to me,
that if the company beat I should probably not get anything, but
332 if they gained the suit they should make me a present or a hand-
some present, I don't remember which were the words. M'r Tanner and Sayles were together, and represented themselves as being together. I didn't know whether M'r Sayles was agent or what he was. M'r Tanner, I think it was, spoke of an interest I had in the brake. I do not think M'r Sayles mentioned it. After this, I was subpœnaed as a witness by the Erie Railroad Company, as I suppose, and went to Albany and testified on a trial there between M'r Tanner and the Erie Company, I suppose. I suppose it was M'r Tanner's lawyer asked me, when I was testifying, if I hadn't been bribed. I said, No, sir. Then he asked me if some one hadn't promised me something. I told him yes, that M'r Sayles and Tanner had. Then he asked me two or three other questions; I don't remember what they were; they didn't concern that at all. Another gentleman then got up, who I suppose was the lawyer on the other side, and asked me what they promised me. I told him they promised me a present or a handsome present—alluding to what had been said to me in my house by them, as already stated. I connected M'r Tanner and Sayles together, because I supposed they were together.

[I become informed, I think in 1855, that M'r Tanner had executed a bond for my benefit to M'r John Durand; that it was left in the office of the Hartford and New Haven Railroad Company, and I obtained a copy of it. I can't tell the date of the bond. After looking at a copy of the bond shown me by M'r Whipple, I see the date is 1851. M'r Tanner made this bond unbeknown to me. I suppose it was given in part to recompense me for my husband's labor on this brake. This was communicated to me from different friends.]

(The plaintiff objects to the testimony included in brackets as incompetent.)

333 I have had some correspondence with M'r Tanner. I wrote to
M'r Tanner some years ago and he wrote a reply, which he asked

me to show to M'r Sayles. I have his reply and will produce it before the commissioner, to be annexed to my deposition.

I took this reply and went to Lansingburgh, and saw M'r Sayles in a store. I showed him the letter, and he read it. He denied taking any of these claims to pay. I think he said he had bought out M'r Tanner, but denied obligating himself to pay what claims there were against M'r Tanner. He said it wouldn't have been wise for him to do that. I couldn't get M'r Salyes to promise that he would pay me anything until I was about leaving. He then said he was soon going South, and if he should succeed well (I suppose in selling this brake, I didn't know) he might give me something himself. He said this bond wasn't given for this brake that they were then using. I should think that there were two or three brakes connected, or parts of two or three brakes, by the way he explained it. M'r Sayles has been at our house several times. I can't say that M'r Tanner was ever there but once. M'r Sayles has taken up considerable of my time in looking at the books and talking about the brake. I kept a hat shop in Cohoes, and he came there. He never made me any compensation for my time and never offered to. M'r Tanner never paid me anything on the bond, nor in any way, directly or indirectly.

Cross-examination by M'r Thomas Sayles, the plaintiff:

I don't remember M'r Nichols drawing any drafts at home while we lived in Hartford, except this one, and one afterwards. He would sometimes, if his tools happened to be at home, draw something for some one to work after, but he generally did that drawing in the shop. 334 I have not talked with M'r Whipple much about this matter. I saw him yesterday, and again to-day for a while. He was out at my place a week ago to-day, I think it was, for a few minutes. I told him he could take my letters and papers and look them over at his leisure. That was the first I knew of this being called up again. I had not thought much about it since my former testimony, except that I was informed by my friends, some weeks after that trial, of M'r Leppen's testimony in court, and I was sorry I hadn't called for that draft, and did think of calling upon him for it, but I did not, and dropped it entirely, and have not thought much about it since until last Saturday.

I should think it was later than October, 1854, but it might have been then that I testified on the Erie Railroad Company. It was my impression it was in 1855. I have never testified before this but on that occasion. It was before that suit in Albany that I saw M'r Sayles several times and talked this matter over and that I saw M'r Tanner. My interview with M'r Sayles at Lansingburgh, when I took M'r Tanner's letter, was since that suit. That conversation was in reference to M'r Tanner's obligations to me, and not in reference to any testimony in any lawsuit in reference to the brakes. The conversation with M'r Sayles at the different times previous to my testifying before was respecting when the brake was put on the car and the car came out of the shop. I supposed the question was then when the car came out with the brake. That was the time of the invention as I then supposed. It did not occur to me that the invention dated from the time of the drawing.

I do remember telling M'r Sayles that my husband, M'r Nichols, while he was drawing this after, and some weeks after, he had commenced it, jumped out of bed one night, slapped his hands and said, "By 335 G—d, I have got it." I was then nearly asleep, and this frightened me, as he had turns of being irrational when he was very unwell. I jumped out of bed, and asked him what in the world ailed him—if he was crazy. He told me to go right back to bed, and he wouldn't be up but a few minutes, or a short time. He said if I didn't he would be obliged to be up till morning. He sat up and was drawing on the draft. I recollect the circumstance very well. The weather that night was quite cold. He took more cold that night. He was quite unwell at the time.

M'r Sayles talked the matter over with me several times previous to my former testimony, and I was pretty familiar with this brake matter, and testified then to the best of my judgment. I was of course a good deal excited at the time.

I testified to all the facts about the brake when I testified in court as I understood them, except that I did not testify anything about the drawing that I think of. I think nothing was asked me about the drawing. If I testified about the drawings, I stated as I understood them then. What I did state about the drawings would be as likely to be as correct then as now, except that I might have brought up some things to memory since, and I have brought several things to my mind what he said about them, and mere particularly about the drawing being so long in the house before he carried it to the shop. I think I did not state in my former testimony that I knew of my husband drawing a plan for a car brake late in the fall of 1846. I don't think the question was asked me; if it was, I don't know how I answered it.

[My husband called the brake he was drawing the double brake, and said it would dispense with one-half the brakemen.]

336 (The plaintiff objects to the clause in brackets as not responsive, the question being whether, if you did testify to a drawing in the former suit, it was not the same drawing which you have testified about now?)

A. If I did testify about a drawing, it was the same drawing as this.

Int. Did you not testify on the former trial that your husband got up the drawing for this brake, in the fall of 1846, in cold weather?

A. I might; I presume that I did; but I don't remember it.

I am sure that M'r Tanner and M'r Sayles were at my house together at the time M'r Tanner told me about making the present. I think M'r Tanner spoke of it, and said "we," and that led me to think that they were together. That is the only time that I think of, when anything has been promised me, except what I have testified to, as to M'r Sayles promised in the interview at Lansingburgh already stated. I never told any one that M'r Tanner had never made me any such offer as that. Of course I did not. I don't recollect that I ever stated that M'r Tanner was not present when the promise was made me that I should have something handsome, if the plaintiffs succeeded. I think that is the only time I ever had such an offer. It is possible that M'r Sayles may have come in and offered something, which I took in that light. I have a faint recollection of M'r Sayles bringing something of that kind up afterwards, but it is nothing that I can rely upon, about M'r Tanner's promise. I think M'r Sayles spoke of it, and spoke of it in the same manner as M'r Tanner had done before, as "we," and I supposed they were interested together.

337 I think I testified on the former trial the same as I have now, in regard to the present that Tanner and Sayles were in, and that they, or he, Tanner, I think it was, made me the offer. I can't tell how long before the former trial it was that this offer was made. I don't know as I could tell within six months. I remember it was to-

wards evening, for it was quite dark in my sitting-room while they were in there.

I don't know that I testified then that it was a year before that the offer was made me. I presume I recollected then nearer the time. I should think I did not say that it was the first time that Sayles called at my house. I should think he had called there before then, but am not positive. I should think the time this offer was made was the only time I saw M'r Tanner at my house, and I am sure that M'r Tanner was there when the offer was made. I should think I did not testify on the former trial that M'r Tanner was not present when that offer was made me. I have no recollection of testifying that no such conversation took place when Tanner was present. I do not recollect of ever having stated to any one that I was frightened by M'r Nichols jumping out of bed and clapping his hands owing to the situation in which I was, but I might have stated so. I was frightened. I might have thought I was in that condition. I was frightened because I thought that he was crazy. I have not told any one that I was then in that condition, and that my child was born four months afterwards. I ought to know when my child was born, day and date. I do not know positively that M'r Nichols had completed this drawing when he took it to the shop, but I supposed he had. He might have completed it at the shop, but I supposed, of course, if he took it off the board it was completed. He took it off the board some days before taking it to the shop. I recollect his
cutting the edges off so that he could get it into his drawer. I
338 don't remember whether he took it off four days or a fortnight
before he took it to the shop. I can't state the time he took it
to the shop. It was some time before I saw it on the car. I cannot state positively how long it was after he took the drawing to the shop before the car came out with the brake on. I think I can swear positively that it was more than four weeks. I cannot swear positively that it was more than six weeks, but I think it was more than that. My husband was quite intimate with M'r Leppens, and I think he would have shown his drawing to Mr. Leppens, when he took it to the shop, before any one else. M'r Leppens used to have charge of the work when he was out. He gave his orders to M'r Leppens. I have often heard him say that M'r Leppens was not a great mechanic. M'r Leppens was foreman under him.

M'r Nichols worked on the drawing at different times up to near the time when he took it to the shop. It may have been two weeks before, but I could not swear that it was two days. As to that I don't remember. I understood from him that the drawing was for the brake. I cannot swear that the brake which was put on the car was not altered or different from the drawing which he took out of the house. He told me that it was the same brake. He didn't tell me that he hadn't altered it.

I cannot give a description of this brake. I can describe it as I have done already, nothing further. M'r Sayles was at my house twice besides the time when M'r Tanner was there with him. I am not positive that it was M'r Tanner. He was introduced to me as M'r Tanner, and I have no doubt it was M'r Tanner. I recollect those two visits distinctly from some circumstances, but I should think he was also there at other times. M'r Sayles was at my house once previous to the
time the Hudson River Railroad was to be tried for this brake. I
339 can't say whether he was there more than once previous to that
time.

When M'r Whipple called a week ago to-day he was there but a short time. We didn't talk over the brake matter much. I handed him the account-book that M'r Nichols kept during those years in Hartford—the same book that I showed M'r Sayles before the Erie suit, and also my papers and letters. I should not think it would not exceed two hours that I have talked with M'r Whipple or any one else since last Saturday in reference to this brake matter.

I can't state how much time was occupied by me in talking with M'r Sayles and others previous to my testifying in the Erie case. I spent a good deal of time in looking at the book and trying to think and recollect, and give M'r Sayles all the information I could in reference to it. I don't know of any one sitting down in the house to converse with me about it, except M'r Sayles and M'r Tanner. It strikes me M'r Fields came and got the book one Sunday evening and carried it away. I should think I spent as much as six or eight hours in all, at different times, with M'r Sayles and Tanner in reference to this brake. M'r Sayles was looking over the book and I was looking over the papers. I supposed he was trying to get at when the car came out onto the road.

Int. Did you not testify, on the Erie trial, as follows: "I knew of my husband's drawing a plan at home of a brake for cars. I should think he drew that plan in the fall of 1846; that was a double brake, as he called it"? and if you so testified, was it true?

A. I don't know but what I did, and if I did, it was the best of my recollection at that time. I do not recollect that I did so testify. I do
not recollect of testifying that "I did not recollect any circum-
340 stance that would show the date any more clearly, but that, to
the best of my recollection, it was in 1846 late in the fall; it was quite cold weather that drawing was made," but I might have said so, not considering or thinking it over.

Int. Did you testify in the case of the New York and Erie road, in 1854, that M'r Sayles told you you should have a handsome present, in case the plaintiffs succeeded in their case; and, further, that that conversation was the first time Sayles was at your house, a year ago that fall, and that no such conversation took place when Tanner was present?

A. I think not. I have no recollection of testifying in that way.

Int. If you did so testify on that occasion, was it true?

A. I don't think it was true, because I think M'r Sayles was there first alone, and afterwards came with the gentleman he introduced as M'r Tanner.

Int. Was that part of it true, that no such conversation took place when Tanner was present, if you so testified?

A. I don't know whether it was or not. I know I testified what I thought was the truth, and perhaps I recollected more distinctly then than I do now.

I do not think that my memory is very good. I do not remember near as well as I used to do. I don't know but what I can remember as well as I could years ago. I never had a very long memory.

Direct examination resumed.

I now produce the letter of M'r Tanner, referred to in my direct examination to be annexed. It is marked "Exhibit F. E. Merwin, U. S. C."

341 My testimony in the Erie case, at Albany, was in the open
court. I think I was on the stand two hours or more. I was very much excited.

Int. Were you confused and bewildered, so that you did not know at times what you said?

(Objected to as leading.)

A. I was very much so.

Int. Do you wish to have it distinctly understood that the facts and dates, as set forth in your direct examination are correct, to the best of your knowledge and belief, notwithstanding the statements in the Erie case?

A. I do, to the best of my knowledge—the best that I can remember, after having considered the whole matter and thought it over. I think it is correct. I supposed, by coming here and talking with M'r Leppens, I could make statements to him so that I would remember positively, so that I could state it as it was. I expected he would produce the drawing, and thought likely the date was on it. I did see Leppens, and talked with him.

Cross-examination resumed:

I learned from M'r Leppens that he hadn't the drawings or that he said he hadn't it. He represented that my husband worked by sticks and strings. I told him that he certainly saw the drawing, and saw it at our house, and I was positive that he had it. We talked it over. I tried to have him acknowledge that he saw the drawing at our house, but he would not. He said he didn't recollect ever having seen the drawing, but that M'r Nichols explained it to him by sticks and strings.

I don't know that he mentioned the time when he saw the sticks
342 and strings. I think he did not. I presume I did try to convince
M'r Leppens that my husband invented it in the spring of 1846, or, rather, I tried to have him convince me. He would not acknowledge that he was convinced. I do not know, I do not recollect, that he mentioned when he thought it was invented. I had this conversation with M'r Leppens yesterday.

SARAH A. ALLEN.

EXHIBIT F.—*E. Merwin, U. S. C.*

BUFFALO, *Nov.* 11*th*, 1856.

MRS. SARAH A. NICHOLS:

I rec'd a letter from you to-day which in some things greatly Surprises me. You speak of a letter from a Mr. Foster having ben before written me, of this I can only say none was ever received by me or it would have ben ansured, but the Language usurd by Mr. Sayles as reported by you is to me beyond all things else suppirising for in the first place, Mr. Sayles is & has Long ben the sole owner of the brake & is collecting money from it I suppose daily & if it was for me to do he knew it was for him to do and not me as in the traid to him was his agreement to me to assined all Claims upon the brake from Every scource *this* honesty on his part should have told you while at the same time he should have explained to you your further position. The writing from me in your behalf was given in view of the brake of Charles B. Turner which was then supposed to be the first invention Except your husbands which had ben made subsequently it was assertained that a Mr.
Bachelder & Mr. Thompson had invented the same thing prior to
343 both Turner and your husband which Cut off both of them and
from Bachelder & Thompson I purchased the rights which I subsequently forfeited & sold to Sayles & it is this brake and not Turners patent that is & has ben sold, this Cut off all Legal Claim which you had from Procedes of any sale made as the one for which the bond was given was not sold but is Dead by reason of the other, this Mr. S. knows

& should have explained. It was my intention however still to have done something for you & I told Mr. S. so and Called his attention to your Case he agreed with me & was of the mind to do, but by the fact of your Testimony in against him on trial of the Suit, I supposed took the other course if indeed he has taken it at all. Now this is the whole of this as I am connected with it. I advise you to take this letter to Sayles and see what if anything he will do & lay the whole matter before him.

Respectfully yours,

H. TANNER.

344 THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.

The deposition of JAMES M. HEBARD, a witness produced and sworn on the part of the defendant, before R. E. Stilwell, commissioner, at the city of New York, on the 24th day of September, A. D. 1862.

(M'r Sayles, the plaintiff, objects to the examination of this witness for the reason that the defendant's time has expired for taking testimony in this case.)

I reside in the city of New York. I am by occupation a railroad agent. I commenced to work for the Hartford and New Haven Rail Company in August, 1845, at New Haven. I commenced work there as a carpenter, and was in New Haven about four months, and removed from there to Hartford, and was employed there at first on a new engine-house. I worked as a carpenter on this new building and a bridge. This was in the winter of 1845 and 1846. When these were completed, I agreed with Willard J. Nichols, who was foreman of the car repairs of said company; that was in April or May, 1846. I worked through the summer of 1846, principally upon trucks for cars; during the winter of 1846 and 1847, most of the time I worked in the old paint-shop, at the same kind of work, trucks, putting in bunters. I left that kind of work late in the winter or early in the spring, it was cold weather, and went into this new engine house and assisted in putting up the shafting.

I helped put up stationary engine. Then I commenced working
345 on engine and locomotive houses, and that was my business principally till I left the road. I was all the time to work under M'r Nichols. I can't tell the time when we commenced talking about the arranging a brake, but it was during the winter of 1846 and 1847.

The first work I done in that old paint-shop—the first I recollect was in arranging rods upon a pair of trucks for a car. These rods we placed at the top of the trucks and made two lines through to connect them with the lever. I made a centre lever of wood of about four feet long. This lever I placed on a box to hold it up between two trucks, as directed by M'r Nichols. Then we placed these wooden rods in line from the brake-levers on trucks over the top of them. Then M'r Nichols said those trucks must be turned round, or alter the levers. This was the first thing laid out to get the length of the lever on the car. I mean the centre lever. Then we had the centre lever made of iron to connect with iron rods, and the rods I oversee the making of. M'r Nichols gave me the direction, and I had the lever and rods made the length, etc. We then put this lever on the centre of the car. I think it was an old baggage-car. It might have been a passenger car. When these trucks were repaired we put them under the car, and changed the levers, took them out, and changed them from the outside to the inside end of the truck. We put on this lever that I got made, and connected by the rods with the levers on the trucks. I had to get new chains to connect the windlasses with the lever.

(M'r Sayles objects to the model being shown at this stage of the case.)

The chain was to connect the windlass with the rods I had
346 made attached to the centre lever, After I got it arranged with the chains and long hooks or rods, there was a number of days while fixing it that it did not work. After making such alterations as M'r Nichols ordered, we tried the brakes. M'r Nichols applied the brakes himself. That is all I remember at this time of the work then done. In applying the brakes and letting them off, time and again we found that the reaction would unhook the hooks from the levers. M'r Nichols found, during the time of these experiments, the centre lever was too short. He then gave directions to have the hooks made from 6 to 8 inches longer. Then we found the centre lever to be too short; it wouldn't give play enough. The strain would come upon the centre lever instead of upon the brakes. So far as that car and the work upon it was concerned the work stopped, and the brake was taken off and laid aside. That was all the work I ever done upon the new brakes. This experiment was done in the winter of 1846 and 1847.

During all that winter we were at work upon a new baggage-car.

These new brakes which M'r Nichols ordered made were put upon this new car. There had to be a new centre lever made. This new brake was perfected on this new car. M'r Nichols directed John Stockbridge to put it on this new car. The idea was to have it put on to this new car. It was the first car he ever built for this company.

(The defendant's counsel now present a model, marked "Model B, E. Merwin, U.S. C.," Nichols' brake, to the witness to be identified as representing the brake as applied to said old baggage-car, pointing out such difference as he may discover, if any.)

347 (Witness continues: This model is not as I put it up. This centre lever was attached to the truck-levers on the inside of the truck nearest the centre of the car, instead of the end, as seen in the model. The short arm of the lever was placed in a jaw of the brake-bar, and the connection of the other bar was made with the fulcrum of the lever, and the same may be said of the other truck, instead of the fulcrum being placed on the bar, as seen in the model. From the circumstance of my working when it is too cold to work outdoors, I worked in the paint-shop when these experiments were made, and I worked at them at different times in the winter of 1846 and 1847. That work was done in some of the months of November, December, January, and February, 1846 and 1847.

Int. Are you sure that none of this work was done in November and December, 1846?

(Objected to.)

A. I am not sure. My impression is it was midwinter. All the draft I ever saw of this brake was a chalk on a board giving the shape of the hooks and lever, how to have them made, and that is the way M'r Nichols described it to me.

These experiments were not carried on in the same shop where M'r Leppens worked as pattern-maker, which was in part of the new engine-house where he worked.

Cross-examination by M'r Sayles, in person, on part of plaintiff:

M'r Nichols, if he had had a draft, would not have been likely to have showed it to me. I did not work from drafts at that time. I never saw a proper draft of anything from M'r Nichols on paper. I
348 cannot swear positive that Nichols made any of those experiments before January, 1847.

Int. Can you swear positive that M'r Nichols perfected the invention of this brake before April, 1847?

A. It is difficult to understand the question. He perfected the plan of it in the winter months of 1846 and 1847. Why I know this is, he had got it all right for the new car. I cannot say that he perfected it before February, 1847.

Direct resumed by M'r Whipple:

Int. Was this brake, after its completion, applied to other cars of the New Haven, Hartford and Springfield road; and, if so, to what extent?

A. I remember very few at this time. It was on two passenger cars and this new car, and was put on baggage cars as they were repaired. I left there late in the fall of 1848. It might have been on more cars when I left, but I don't know. I remember perfectly the appearance of M'r Nichols the first time he tried the brake in bringing up a train. It was early in the spring of 1847, or the spring after I done the work. My impression is it was pleasant weather, but cold; he had an overcoat on, buttoned up. It was his triumphant look that impresses it upon my mind; that is, looked satisfied that he had accomplished what he wanted, as he brought up the train with his brake without assistance from others. I done no work on this brake after I went to work putting up shafting, before alluded to.

JAMES M. HEBARD.

Subscribed and sworn to before me this 24th September, 1862.

R. E. STILWELL,
U. S. Com'r.

349 THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY COMPANY.

The deposition of JAMES MILLHOLLAND, a witness produced and sworn on the part of the defendant before Charles F. Heazlitt, commissioner at Philadelphia, Pennsylvania, on the twenty-sixth day of September, A. D. 1862.

(M'r Sayles objects to the examination of the witness upon the ground that the time for taking defendant's testimony has expired.)

Int. What is your age, residence, and occupation, and what is your profession?

A. I shall be 50 years old the 6th day of next month. I reside in Reading, Pennsylvania. I am a master machinist on the Philadelphia and Reading Railroad, and have been so employed for 14 years on the 1st of August last. Previous to my becoming attached to the Reading Railroad, I was 10 years engaged on the Baltimore and Susquehanna Railroad as superintendent of machinery; now called the Northern Central Railroad.

During this ten years I put a brake on a passenger-car (that is to say, about the year 1843 I put a brake on a passenger-car), which I will describe as follows: It broke upon all the eight wheels from either end of the car; the brakes were operated by means of a drum placed under the car, about the centre; there were connections running from 350 this drum to the levers on each truck, and also from the drum to the windlasses of the car. Under the centre-pin of each truck was suspended a vertical lever with a fixed fulcrum; from the lower end of the lever the connection ran to the brake farthest from the end of the car. From the upper end of this lever, equidistant from the centre of the lever, the connection run to the brake-bar at the end of the car. From the upper end of these levers a connection was made with the drum or barrel under the car between the two trucks, about the centre of the car. From this drum connections run to the windlasses at each end of the car, and by winding up either windlass the brakes were applied to all the wheels at one and the same time.

(Defendant's counsel presents a model, marked "Model C., C. F. H.," to the witness.)

Int. Mr. Millholland, is this model a correct representation of the one which you put upon a car on the Baltimore and Susquehanna road about the year 1843?

A. I think it is, with the exception that the lever under the bolster in the trunk is too near the track. I can't state positively the time it was in use. It was used, however, a considerable time. It was a new thing upon the car, and was not in favor with the brakemen in consequence of it having to be operated by the hand instead of with the foot, as was customary to operate brakes at that time on that road. I can't speak positively as to the time of discontinuance of the use of that brake. I built eight-wheel tenders some time after constructing the brake on the car, about the year 1845 or 1846, I believe. The tenders were built for the locomotives W'm H. Watson and Gen. Taylor. The manner in which these brakes were constructed was to place a lever on each centre-pin in the trucks below the bolster, with rods connect- 351 ing the levers equidistant from the centre of the lever to the crossbars on the brake-blocks, one rod connecting the two levers together at the one end of each lever. Another rod from the end of the lever in the front truck running to a cross-shaft, and connected to an arm on the shaft. On the outer end of this cross-shaft, outside of the tender-frame, the shaft being placed about the middle of the frame lengthwise of the tender, was a long lever attached, which extended to the foot-board of the tender, and by the fireman pressing on the end of the lever operated the brakes upon all the eight wheels equally upon each pair of wheels.

Int. Wherein does the application of this brake to the trucks differ from that seen in Model C, C. F. H., and wherein does the cross-shaft differ from the drum of said model?

A. The levers in the trucks of the tenders were the same, but placed horizontal, and the levers placed in the passenger-car trucks placed vertical. The only difference between the cross-shaft and the drum is that the connection is to an arm on the shaft, which might represent half a drum performing the same duties as a drum itself.

Int. Could this rock-shaft with arms be operated by a windlass, as well as by a long lever at the side of the tender?

A. It could, by fixing an arm on it directly opposite to that to which the brakes are connected, and by connecting said arm to a windlass.

Int. Why did you substitute the long lever for the windlass, as seen in Model C, C. F. H.?

A. Because it was not necessary to operate the brakes but from
352 one end of the tender, and it was the customary method of operating brakes on tenders at that time, and that method is used now to a very great extent.

Int. Could the brakes upon these tenders have been operated from either end, if it had been necessary?

A. They could by substituting a windlass at either end, and attaching them to an arm, placed on the shaft directly opposite to the arm to which the brakes are connected.

(M'r Millholland requests that his last answer be again read to him, and it is so read to him.)

WITNESS. I desire to correct that answer. What I mean to say is, that one of the windlasses should be connected with this arm, placed on the shaft opposite to the one to which brakes are connected, and the other windlass connected with the arm to which the brakes are connected.

Int. Was the use of windlasses to operate the brakes objected to and opposed by the brakemen as a substitute for a lever and treddle for operating the same; and was this a reason for discontinuing the use of the drum-brake, Model C, C. F. H., and its application to the tenders of engines?

(Objected to as leading.)

A. They objected to it on that account, and they thought it was harder to operate than the treddle.

(Defendant's counsel withdraws the last member of the question.)

Int. To what extent were the brakes applied to the tenders of engines when you were upon the Baltimore and Susquehanna Railroad, and since that time?

A. I don't understand the question.

353 Int. To what extent was this brake applied to tenders?

A. I am under the impression it was applied to several tenders on that road. I am not positive.

Int. Up to what date were they in use upon the tenders of that road?

A. I saw one on a tender on that road about six months ago.

Int. Did you, while on that road, connect the rock-shaft brakes in each truck with each other and with the windlass of the car?

A. I did on some of the freight-cars, and connected it with the treddle-brake on one end of the car only, about the time that I put on the passenger-car the drum-brakes operating on the eight wheels of the car at either end.

Int. Will the witness please describe the brake which he put upon a car of the Reading road when he took charge of the machinery of that road?

A. The first, what is called the double-acting brake, operating upon all eight wheels from either end of the car, is what is known as the centre-lever brake, the same as what is called the Tanner patent brake. This brake I applied, to the best of my knowledge, in the latter part of 1848 or in 1849.

Int. In applying this brake, did you consider the centre-lever an equivalent of the drum, as seen in Model C, C. F. H.?

A. I do so consider it.

Int. Is this brake a continuation of the experiments commenced by yourself in 1843 and terminated in 1848 or 1849?

354 A. I consider the brake I put on the passenger-car of the Philadelphia and Reading Railroad in 1848 or 1849 a continua-

tion of the experiments I made on the Baltimore and Susquehanna Railroad.

Int. Is this brake still in use upon the Reading road?

A. It is.

Int. Wherein has it been modified from the first application in 1848? (Objected to by plaintiff.)

A. The centre lever has been used to work in combination with the levers of John Lahay's patent self-acting brakes, for the purpose of operating Lahay's brake by hand. In some cases, in the application of the centre lever, the lever in the truck to which the centre lever is connected is placed next the ends of the car, instead of on the cross-bar, at the two inner ends of the truck.

Int. Defendant's counsel now presents drawings and specifications of a brake, marked "Exhibit D, C. F. H.", and asks the witness if these drawings and specifications correctly represent the brake in question, and says: Will you file this certified copy from the Patent Office and make it a part of your deposition?

A. I think they do represent the brake in question—I mean the brake I put on the Philadelphia and Reading road in 1848 or 1849; to the last member of the question I answer, I will.

Int. What object had you in view in constructing a double brake about the year 1843?

A. My object in applying a double brake to all eight wheels was that I might have the same retarding force on the eight wheels, that if applied to four wheels only would stop the wheels from turning and make them slide on the track, to do which injures the wheels, as it wears flat places in them, and having grades of eighty-five feet to the 355 mile, the brakes were pretty severely used on that portion of the road.

Int. Did you attain the object you had in view in the construction and arrangement of the brakes, of which C, C. F. H. is a model?

A. I did.

Int. Had you desired more power upon the brakes how could you have obtained it in the brake already alluded to?

A. By increasing the size of the drum that the chain is on, connecting with the windlasses; and it could also be increased by diminishing the drum that the chain winds on that leads to the levers under the bolsters in the trucks. The power could also be increased by lengthening the upper ends of the levers under the bolsters in the trucks. The lengthening of the upper ends of the levers under the bolsters in the trucks can be accomplished by bringing the points of connection of the levers nearer the centre upon which the lever works.

Int. Was it regarded as a requisite quality in a brake, in times referred to (1843), to be of sufficient power or leverage to slide or check the wheels when the brakes were applied?

A. It was thought so by some, and left to the judgment of brakemen to operate.

Int. Did M'r W'm Leahy, working under you on the Boston and Susquehanna Railroad about the year 1847, arrange and combine the brakes of both trucks of a car with the levers in the trucks and the windlasses of the car, and operate the same from either end?

A. He did; but I do not remember whether he used a treddle or windlasses at the ends of the car.

356 Int. Is the centre lever in the trucks of Model C, C. F. H., the same as the centre lever applied to the body of the cars on the

Reading road in 1848 and 1849; and, if so, does it perform the same office, to wit, equalize the power between two opposite points.

A. It is not exactly the same as the lever under the body of the car applied to the cars on the Reading road in 1848–'49; that was equal lengths from the centre, and the connections were made between the ends and the centre which ran to the lever in each truck, and the connection from each end of the lever connected with the lever at each end of the car, whereas in the model there is but one arm to the lever where the connections from the drum are attached; and it does equalize the power between two opposite points, that is to say, its performs in one truck what the lever in the centre of the car does between the two trucks.

Int. Did you ever know or hear of the use of a centre lever under the body of the car, as seen in Exhibit D, before you applied it to a car on the Reading road in 1848 or 1849?

A. I have no recollection of ever seeing one in that position before.

Cross-examination by M'r SAYLES:

I do not recollect ever having put the drum-brake like Model C on to but one car. I can't be positive that it was put on in 1843; I think it was about that time; it was several years before I left the road. What was called the rock-shaft brake in between the wheels was the brake usually used at that time upon the passenger and freight-cars on that road. It was worked with a treddle. These brakes acted only upon one truck. I don't recollect what brake was put on the passenger-car when the drum-brake C (C. F. H.) was taken off. I don't recollect whether a single or double brake was put on.

357 I never heard of any complaint of the brake itself (the drum-brake C) not working well.

Albert Fisher was an engineer upon the road at that time. I mean at the time the brake was used on the road. I can't say; I can't recollect if John Yakel was a brakeman on the road at that time. M'r Denmead was employed as foreman in the machine-shop at that time. M'r Isaac Denmead.

I don't recollect who ordered this brake to be taken off the car. I can't recollect at this time whether I did or not; I think it is possible I did; I won't be certain. I can't say exactly what time in 1846 I put the brake on the tender. I am satisfied it was in 1846. I built two engines at the same time, and the engines were commenced in 1845, to the best of my knowledge.

M'r Leahey put on his brake subsequently to my putting on this brake C; but how long after I can't say. I can say positively it was put on as early as 1847, because I left the road in 1848. I left the road the latter part of July, 1848, and commenced on the Reading Railroad on the first of August, 1848. I can't say if it was put on in 1847, but I am satisfied it was not put on later than 1847. I can't say if it was put on prior to July, 1847. I have nothing to govern me as to date or time. I can't say if it was put on prior to October, 1847. I can't speak as to dates.

I cannot testify accurately as to the proportions of the drum-brake, as it was put on about 1843, nor can I say that the proportions are accurately represented in the Model C.

I think the brake I attached to the Reading car on the Reading road in 1848 or 1849 was a great improvement on the single treddle-brake, as used on the Baltimore and Susquehanna road. I can't say positively how many double brakes like the Tanner brake I put on the Read

358 ing road; perhaps eight or ten. I put them on soon after I put the first one on, as I have testified.

I told Leahey he might put his brake on the car, on the Baltimore and Susquehanna Railroad. He asked my permission to try it, and I allowed him to do so. I don't know how long its use was continued. I lost sight of it. I have not seen it, to my knowledge, but I have no recollection of its being taken off. I did not consider it an improvement on the drum-brake I put on; there were too many parts in it.

Int. Could the brakes, as they were attached to those tenders to which you have testified in your direct examination, be operated from either end of the car or tender without some additions being made to the brake apparatus?

No, sir.

I can't say positively how long these tenders were. I should think from eighteen to twenty feet. The lever attached to the rock-shaft must have been seven or eight feet long, and extending along the side of the tender, and must have been three and a half inches wide where it was attached to the rock-shaft and about one and a half at the end; and I should think about three-quarters of an inch thick.

JAMES MILLHOLLAND.

Examination taken, reduced to writing, and by the witness subscribed and sworn to this twenty-sixth day of September, A. D. 1862, at Philadelphia.

CHA'S F. HEAZLITT,
U. S. C.

(Patent omitted; see patent on page 23.)

359 THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY
Company.

The deposition of John C. A. Smith, a witness produced and sworn on the part of the defendant, before John Hanan, commissioner, at Baltimore, Maryland, on the 27th day of September, A. D. 1862.

My name is John C. A. Smith. I reside in the city of Baltimore, State of Maryland. I am fifty-three years old, and my occupation, foreman of the car establishment of the Northern Central Railroad, formerly known as the Baltimore and Susquehanna Railroad. I have been in the employ of said railroad since the year 1861.

I knew James Millholland. He was master of machinery on the said road up to the year 1848. There was a double-acting brake on the said road, put on by M'r Millholland with his direction. It was put on, to the best of my recollection, in the year 1843.

The witness is now shown a model marked "C," James Millholland, September 26, 1862, and is asked if it is a model correctly representing the brake applied by the said Millholland to a passenger-car of the Baltimore and Susquehanna Railroad, as already testified by the witness, and says,

It is.

Int. Please state what you know of the application of a double brake to the tenders of engines on the Baltimore and Susquehanna
360 Railroad, and state the names of the engines to which said brake was applied and the date of application; and who applied said brakes, or caused them to be applied.

(This question objected to, as leading, by the plaintiff.)

Ans. There was a double acting brake applied to engine Watson's tender, and also applied to engine Gen. Taylor's tender, in the year 1846-'7. The Watson's was put on in 1846. The Gen. Taylor's, I am not positive, was put on in 1846, but am positive it was put on early in 1847. They were put on by the direction of James Millholland.

Int. Did this brake apply to all the wheels of the tender at one and the same time, and was it a double-truck tender?

Ans. It did apply to all the wheels at the same time, and was a double-truck tender.

Int. Are you knowing to the fact that one William Leahy constructed and applied a brake to a baggage-car on said Baltimore and Susquehanna Railroad that operated on all the wheels from either end of the car?

Ans. There was a double-acting brake put upon a baggage-car and applied to all the eight wheels put upon by M'r William Leahy, under the direction of James Millholland, which acted from either end of the car. This brake was put on in the latter part of 1847 or the early part of 1848.

Cross-examined:

Int. Was the drum-brake like "Model C," to which you have testified, continued on the road; and, if so, how long?

361 A. I don't know how long, but to the best of my recollection from one year to eighteen months.

Int. Was its use discontinued; and, if so, when?

A. It was discontinued; I don't know the precise time when. The car was taken into the shop in June, 1845, to be rebuilt.

Int. Was this brake removed from said car when it was rebuilt in June, 1845?

A. My impression is it was.

Int. What kind of a brake was put on the car after it was rebuilt?

A. I don't recollect, but am under the impression that the drum-brake was put on, and subsequently a treadle-brake or single brake.

Int. Have you been examined as a witness in regard to this drum-brake previous to this time, and which has been shown to you and is marked "Model C," and have you stated in former depositions that the single treadle-brake was put on to the said car after it was rebuilt in June, 1845?

A. I have been examined in regard to the brake on model marked "C," but don't recollect now that I did state about the treadle-brake being put on, as I have not the evidence given by me at a former time in my possession.

Int. Do you mean to swear that the drum-brake was put on said car after it was rebuilt in June, 1845?

A. I mean to state that is my impression.

Int. Can you swear positive that the drum-brake was put on said car after it was rebuilt?

362 A. I cannot; I only speak from recollection.

Int. What do you mean in your last answer, when you say, "I only speak from recollection"?

A. I am not positive; my memory teaches me so.

Int. Are you positive as to the year the said drum-brake, like "Model C," was first attached to the passenger-car on the Baltimore and Susquehanna Railroad?

A. I am not positive, but speak from memory and circumstances.

James Millholland took a tour to the New England States, and when he returned he applied this brake to the car. I think it was about the year 1843. I have no dates, I speak from memory.

Int. Can you swear that Model C is correct in all of its proportions?

A. It is a correct representation.

Int. In your last answer do you speak from memory alone?

A. I do; from memory and impression.

Int. Can you swear that Model C is correct in all of its detailed proportions?

A. I cannot, in all its details; but so far as I can see and judge, it is a correct representation.

Int. Did the brakes on the tenders to which you have testified, operate from either end?

A. They did not; they only operated at one end.

Int. Please describe the brake, as put on said tenders.

A. They operated by means of levers and connecting-rods.

363 Int. Will you describe the different parts of said brake on said tenders, minutely?

A. It was constructed with vertical levers, to the centre of the track-bolster, similar to Model C. Instead of a drum, there was a horizontal rock-shaft attached to the centre of the tender-frame, with a lever attached to the centre of the rock-shaft, at right-angles. The connecting-rods were attached to the lever on the rock-shaft—to the levers at the centre of the trucks of the outer end of the rock-shaft. At the side of the tender-frame was attached to lever running to the front of the tender, by which means the fireman worked the brake; subsequently, those levers at the centre of the trucks were changed from vertical to horizontal. The levers attached to the rock-shaft were from six to eight inches in length.

Int. Would a brake like that you have stated was put on the tenders be a practical brake for a long passenger-car, and could it be operated by a windlass from either end of the car?

A. It would not be for long passenger-cars; it could be operated by a windlass or lever from either end of the car.

Int. How could it be operated from either end of the car? Describe how it could be operated fully.

A. By extending the rock-shaft to the other side of the frames, attaching a lever to the other side of the rock-shaft running to the other end of the car or tender.

Int. What is the length of the passenger-cars on the Northern and Central Railroad?

A. About forty feet.

Int. How long would that lever require to be in that passenger-car?

364 A. About twenty-odd feet, but on the tender it would require from eight to ten feet, and on our passenger-cars of that day it would require from fifteen to eighteen feet. Our tenders were only eighteen feet long, but a passenger-car at that length, it would be more practicable with a windlass at each end. The witness means to say that with a long lever it would require a longer fulcrum to the short lever on the rock-shaft.

Int. How many passenger and baggage cars were on the Baltimore and Susquehanna Railroad in the year 1845, and how many in 1848-'9, and in 1852?

A. I have no account of how many; there were six passenger-cars, and I think two baggage-cars, in 1845. In the years 1848-'9 there was about eleven or twelve passenger-cars and three baggage-cars. In 1852, about thirteen passenger-cars and from three to four baggage-cars.

Int. What kind of brakes were in general use on the passenger-trains on said road from 1845 to 1853?

A. Foot-treadle brakes, with the exception of this drum-brake, and the Leahy brake. The drum-brake was never attached but to one car, and the Leahy brake to one car. We never had any brakes with rock-shafts attached to passenger or baggage cars on the Baltimore and Susquehanna road.

Int. Can you swear that the brake shown in Model C correctly represents, in all its detail proportions, the drum-brake put on a passenger-car by James Millholland, about the year 1843, as you have stated?

A. To the best of my knowledge it is a correct representation.

365 Int. Did you have drawings or models of the original brake as it was put on said car by said Millholland, or have you seen any model or drawing of the original brakes since that brake was taken off the car?

A. Don't recollect of having seen any drawings or models at the time it was put on, but have seen a model since it was taken off.

Int. What model, and when?

A. I saw a model at one time on a former examination, shown by Mr. Randall and M'r Hubball, in 1859 and 1860.

Int. Was John Yakel a brakeman on the Baltimore and Susquehanna Railroad when the drum-brake was on the car?

A. He was probably when the drum-brake was on the car.

Re examined:

Int. Are brakes like those put upon the tenders of the Wafson and Taylor still in use upon your road?

A. I think there is one, and it has been in general use since 1846, with the exception of change of lever in the truck from a vertical to a horizontal position.

Int. Can you give any particular reason for the discontinuance of the drum or Millholland brake?

A. I cannot, except some of the brakeman were prejudiced against the double brake and preferred the double brake which was easier to operate on by the foot.

J. C. A. SMITH.

366 THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.

The deposition of WILLIAM LEAHY, a witness produced on the part of the defendant, before John Hanan, commissioner, at Baltimore, Maryland, on the 27th day of September, A. D. 1862.

My name, William Leahy. I reside in the city of Baltimore, State of Maryland. I am between forty-seven and forty-eight years old, and my occupation a carpenter, and am now employed by the Northern Central Railroad Company in repairing cars, and have been so employed since 1839, till last April was a year. I know James Millholland. I first became acquainted with him 1839, at the Bolton depot; he was then master-machinist of the Baltimore and Susquehanna Railroad, now the Northern Central Railroad. I know of his getting up a double-acting brake while he was on said road. The brake went by the name of the organ or drum brake. The model now shown to me, marked

"C, James Millholland," is, I think, a correct representation of the drum-brake, and the relation of one part to the other, as far as I can see, is correct.

As far as I can recollect, and it is the impression on my mind, that it was put up in the year 1843. I did design the connecting between two single-acting brakes, so as to form a double-acting brake, and the drawing now shown me, marked "Exhibit G," and thereto annexed, is a correct representation, as far as I can judge, from this rough
367 drawing, and the description of the same on the drawing Exhibit G, is correct.

This brake was applied about the year 1847; it was applied to a baggage-car by permission of M'r Millholland. I think it was in operation pretty nearly a year, and was in operation when M'r Millholland left the road. I think he left in August, 1848. I heard of no opposition to the double brake from the men on the road except one, and he complained that it hurt his breast. The majority of the brakes on that road were at that time single-treadle brakes, worked by the feet instead of the arms. I heard no one say that they preferred the treadle-brake to the double brake, except the one man above alluded to who said it hurt his breast.

Cross-examined:

I think I put the brake described in Exhibit G on the cars in the fall of 1847. I never put it on any other car. I think when that brake was taken off the cars, a single-acting treadle-brake was put on in its place. The reason I heard why it was taken off was that it hurt that brakeman's breast; the reason this was put on was that the single-brake was too powerful, it slid the wheels. M'r Millholland told me to keep the car in till he could devise a means to connect the brakes of the two trucks so as to form a double-acting brake. I called upon him twice to devise the means; he told me he was too busy then and to wait. I then went down to the car and thought of those two connections, that is, of connecting the two single brakes together, and then informing M'r Millholland of my plan, which he approved, and told me to put it on. I did not consider it an improvement on the drum-brake. I don't know why the drum-brake was not put on if they wanted a double-brake. I
368 cannot swear that Model C is correct in all its detailed proportions. I cannot swear positively what year it was put on the car. I cannot swear that the brake on Model C is correct in all its proportions. I don't know that the brake in Model C was ever put on more than one car. I think the single-treadle brakes were in general use on the Baltimore and Susquehanna Railroad up to about the year 1853. I think they had but five or six passenger and baggage cars running in 1843, and may be six or seven in 1845.

I cannot swear positively that they were not running more than ten passenger-cars when they abandoned the Millholland brake. My impression is that the same drum-brake was put on the car after it was rebuilt. I don't think it was kept long on after the car was rebuilt.

I have been examined as a witness before this in regard to this drum-brake.

I do not recollect having said that the single-treadle brake was put on the car when it was rebuilt. It was my impression that the drum-brake was put on when the car was rebuilt, but I am not positive.

I think John Yakel was not a brakeman when this drum brake was first put on, but it was before it was taken away. I can't swear positively that he was not there when the drum-brake was first put on.

WILLIAM LEAHY.

368½ THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY Company.

Exhibit No. 5. Supreme Court record.

W'M H. BRADLEY,
Clerk.

369 EXHIBIT E.

Circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY Company.
} In equity.

Defendant's new proofs.

371 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.
} In equity.

Testimony taken on the part of the defendant for final hearing, by R. E. Stilwell, examiner, &c., under the 67th rule of the Supreme Court of the United States.

WEDNESDAY, *July* 31*st*, 1867.

Present, S. M. Whipple, esq., counsel for defendant; Thomas Sayles, esq., counsel for complainant in person.

EDWIN LOCKWOOD, called and sworn as a witness on the part of defendant, deposes and says:

(The plaintiff in person objects to the taking of testimony, on the ground that it is illegal, as the testimony is not set out in the defendant's answer.)

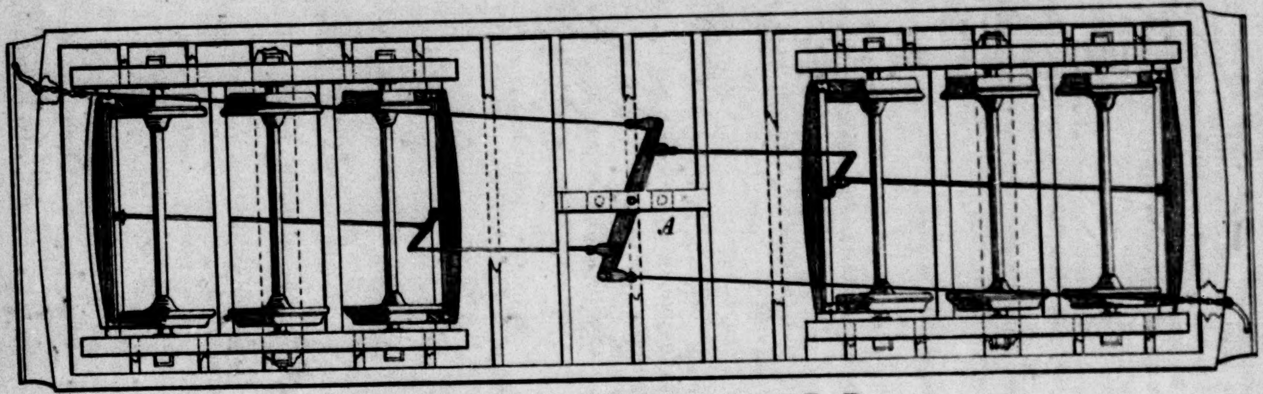
372 Q. 1. What is your name, age, residence, and occupation?

A. Edwin Lockwood; 56 years of age; I reside at Bordentown, New Jersey; and am the master car-builder of the Camden and Amboy Railroad Company, and have been employed in that capacity thirty years.

Q. 2. During that time have you made any experiments in railroad car-brakes? And if so, state the result of those experiments; and what kind of a brake you finally adopted; and when did you put such brake in use upon a car on the Camden and Amboy Railroad; and what are the circumstances connected with the putting into use said brake; and is the model here presented, marked "Car John Tyler, Camden and Amboy Railroad, Exhibit A," a correct representation of said brake?

A. I have made a great many experiments in car-brakes in various forms; I tried brakes by clamping the wheels on both sides on four-wheel, eight-wheel, and twelve-wheel cars; I have also tried experi-

EXHIBIT A.



Car "JOHN TYLER," Camden & Amboy R. R.,

R. E. STILWELL, Examiner, &c.,
July 31, 1867.

ments with brakes by applying a block on the rail between the wheels, the object being twofold—both to save the wheel from getting flat, and to stop the speed of the train. We finally adopted a cross-lever brake attached to the body of the car, and the trucks attached to that in the form shown in model, "Exhibit Car John Tyler, Camden and Amboy Railroad, marked A." We put the brake on the car from the first of May to the tenth of June, 1843, and the car was put on the road at that time, and conveyed John Tyler, then President of the United States, on his tour east to the celebration of the Bunker Hill Monument. The car was ever after that called John Tyler, by lettering it on both ends inside the car.

Q. 3. How do you determine the date referred to in your answer, to wit, the 10th of June, 1843?

A. From the engineer's time-book of that year, dated Saturday, June 10th, 1843, I find this entry: "Charles Yundt, engineer; John Holland, fireman; special train, with the President, Bordentown to Camden and back, and to Princeton, and then back to Camden." I also find in the car-book in the shop this entry: "(Tyler) car 19, twelve wheels,
373 P. & T. R. R. Co., 1843 (rebuilt January, 1849). It was an old car when brought there from the P. & T. R. R. Co.; it was brought there in 1842, and rebuilt and put on the road in 1843, as represented in Model Exhibit A. I mean the running-gear and brakes were the same as in Model Exhibit A.

(Books objected to without they are put in as exhibits.)

Q. 4. How long were said brakes in use upon said Tyler car?

A. From the time they were put on, in 1843, until the car was destroyed, some two years ago last fall, as unfit for use.

Q. 5. Was the brake referred to applied to other cars on the Camden and Amboy Railroad; if so, to what extent?

A. They were applied to other cars. We also applied it to a crate-car for carrying baggage, which was put on directly after that. We continued then putting it on all our cars for passenger and baggage use as we could spare them off the road. Our cars at that time were very limited, and when we took any of them in for repairs we applied the brake.

Q. 6. Are the cars of the Camden and Amboy Railroad at the present time equipped with such a brake as is represented in Exhibit A, and has such brake been in use continually on said road from the year 1843 to the present time?

A. They are so equipped, and have been in use on said road from 1843 to the present time.

Cross examined by M'r Sayles:

Cross 7. How soon after this brake was put on the Tyler car was it put on other cars?

A. As I said before, I cannot give exact dates, but we put it on in succession as fast as the cars came in for repairs.

Cross 8. State, as near as you can, when it was put on other cars.

374 A. I cannot fix any dates at all.

Cross 9. Was it a month after or six months after?

A. You have my answer before; I cannot fix dates other than I have stated before. They were put on in succession as they came in.

Cross 10. Was it put on any other cars during the year 1843?

A. Yes, I should judge so, on a number, but am not positive. I judge so from the fact of its being an effective brake.

Cross 11. About how many were put on during the year 1843?

A. I cannot answer nearer than I have done. I have answered to the best of my knowledge.

Cross 12. Will you swear that said brake was put on any other car during the year 1843?

A. I will swear, to the best of my knowledge and belief, there was.

Cross 13. About how often did passenger and baggags cars come into the shop for repairs at that time?

A. That depended upon circumstances. If a car had a broken wheel or shaft, or a hot box, or any small casualty, a car would come in and go out again in an hour.

Cross 14. Did you continue to put on brakes like Exhibit A on all your passenger-cars from 1843 to the present time, when you put double brakes on the cars?

A. Yes; we have continued to put the same brakes on. I have not put on any other brakes. Other parties have put on brakes under my protest.

Cross 15. Who put on any other brakes, and what brakes, and when were they put on?

A. Stevens put his brake on and Hodge put his brake on. I think they were put on after 1850; I can't tell the date. They were put on on the plea that we were infringing their patents, and they claimed that they had a right to the brake we were using, and I was directed to put them on by the superintendent, and if we were infringing, we would compensate them for it.

375 Cross 16. Please tell, as near as you can, how many of the Stevens brakes and how many of the Hodge brakes were put on.

A. I think there were two of the Stevens. How many of the Hodge I cannot say; there were two or more of the Hodge.

Cross 17. Can you tell whether the Stevens or Hodge brakes were put on in 1850 or 1851?

A. I told you as near as could. I cannot give dates; I have no data.

Cross 18. Do you not keep a record of the dates of putting on improvements on cars of any kind?

A. No, sir.

Cross 19. Are you acquainted with the construction of what is known as the Hodge and Stevens brakes?

A. Well, I think I understand the Stevens brakes as having four upright levers—two on each truck—and a connecting bar running from one pair of wheels to the other in each truck, and a connecting rod running from truck to truck, and then a rod running from end to end of the car for the appliance of the brake. The Hodge brake has two cross-levers hung on swinging or moving fulcrums. There is one upright lever to each truck, and a connecting rod running from the block on one pair of wheels to the block on the other; and also a connecting rod running from the cross-lever to the brake-shaft on each platform of the car.

Cross 20. How long were the Stevens and Hodge brake kept in use on the road?

A. I think there are some of them in use yet, the company having purchased the right to use them.

Cross 21. Which of the three brakes—the Hodge, the Stevens, or the one like Exhibit A—did you consider the best brake?

A. The one on the model A I consider the best.

Cross 22. Why do you consider it the best?

A. Because it is the cheapest and most effective.

Cross 23. After the trial of all three of them, did you consider one like Exhibit A applied the power as equal, or more so, to the wheels than either of the other two brakes?

376 (Objected to as irrelevant and as not in the direct examination.)

A. I consider that as the most effective brake.

Cross 24. Which of the three brakes in question do you consider applies the power most equal to the wheels of the car?

(Objected to, as the witness is not introduced as an expert.)

A. I think the brake in the model Exhibit A is the most effective brake.

Cross 25. Do you think the wheels of a car will last as long, or longer, when brake like Exhibit A is used or when either the Hodge or Stevens brakes are used, from the experience you have had with all of them?

A. Yes.

Cross 26. When did your company purchase the right to the Hodge and Stevens brake?

A. I cannot tell. I have no knowledge about it.

Cross 27. Did you ever learn from the officers of your company that they had purchased the right to use the Hodge and Stevens brake?

A. I heard M'r Van Ransaeller (the superintendent) say that he thought we had purchased the right to use the Hodge and Stevens brake.

Cross 28. About what time did he tell you this?

A. About two months ago we were talking about the brakes, and M'r Van Rensselaer told me that he thought that they had purchased the right to use the Hodge and Stevens brake.

Cross 29. Do you know whether that company ever bought the right to use what is known as the Tanner brake?

A. I do not. I don't know anything about it.

Cross 30. Did you ever learn from any of the officers that they had?

A. No. I heard you say they had.

377 Cross 31. When did you hear me say they had?

A. From four to six weeks ago.

Cross 32. Did you never hear so before?

A. Yes, sir; I heard so at one time when M'r Whipple was there, they had bought all the brakes.

Cross 33. When was that?

A. It was previous to M'r Sayles being there.

Cross 34. How long previous to my being there?

(Counsel for defendant objects to this cross-examination as being no way involved in the direct examination.)

A. Perhaps a month, perhaps more; I can't say.

Cross 35. Did you not hear that your company had bought the right to use the Tanner brake before M'r Whipple was there, a few months ago?

A. I heard M'r Van Rensselaer say that he believed he had bought all the brakes, but he did not know whose they were; this, I should think, was about a year ago.

Cross 36. Do you recollect M'r Sayles, complainant, calling at your shop, in Bordentown, the latter part of July, or the first of August, 1852, and showing you a copy of the said Tanner patent for car-brakes?

A. No, sir; I don't think there was anything of the kind ever transpired?

Cross 37. Do you mean to say that nothing of the kind did transpire about that time?

A. He never showed me a model at that time, or a drawing, that is what I mean to say, nor any other time to my certain knowledge and belief.

Cross 38. Did M'r Sayles call on you at your shop in Bordentown in the winter of 1853 and 1854, and show you a copy of the said Tanner patent, and make enquiries of you about a certain double-acting brake being put up on a car in Jersey City (having a central lever, similar to the Tanner patent) by Joseph F. Talsom, called the Isaac New-Stanley brake, in 1841?

A. I have no recollection of anything of the kind, and don't
378 think it transpired, or I should have recollected about it.

Cross 39. Did you not tell said Sayles at that time that you knew nothing about such brakes being put on at Jersey City at that time?

A. I have no knowledge of anything of the kind.

Cross 40. Did you tell said Sayles at that time that you did not think it could have been used long on a car running from Jersey City to Philadelphia or Camden, or you would have known it?

A. No, sir; I did not tell him so then nor at any other time.

Cross 41. Did you not tell Sayles at that time that your company had purchased the right to use the Hodge brake?

A. I did not tell him so then nor at any other time, and never saw him to my knowledge until from four to six weeks ago, and then I told him that I had no recollection of him; he then undertook to tell me about things which had transpired years ago; I told him that I had no recollection of any such transaction; I told him that I did not know him; I asked him who he was, and he said his name was Sayles, and that he was the man who owned the patent brake; and then he asked me if I didn't recollect his coming to Bordentown at the shop with a brake, and through my recommendation M'r Van Rensselaer had it put on the car, and through my recommendation, he said, it was put on; I told him that nothing of the kind had transpired; then he said I must be mistaken, and he wished to know if he couldn't do something for me to say that I was mistaken as to date; he said if I could that would leave a doubt as to the date of putting the brake on the car; he said it was worth hundreds of thousands of dollars to him, and he had a suit pending at Chicago for $40,000, and had it not been for the model called the John Tyler, Exhibit A, it would have been decided in his favor; in response to him, I said I was open to conviction, and if he could show me I was wrong I would own it, but I was sure I was right.

(All the answer objected to after the words "no recollection of him.")

379 Cross 42. Did not M'r Sayles call on you at your shop in Bordentown in the fall of 1855, to get a settlement with your company for the use of the said Tanner patent, and did he not claim to you that the brakes you were using on your cars infringed the said Tanner patent?

A. Have no recollection of any such transaction.

Cross 43. About how many cars, as near as you can tell, did you have the Hodge brake on in 1855?

A. I can't tell; I think I answered that question once before as near as I could tell.

Cross 44. About how many passenger and baggage cars did your company have in 1855?

A. There were 77 all told in 1856, and 106 cars in 1864.

Cross 45. How many were there in 1843, and in each year after to 1856?

A. Nineteen, and the John Tyler car was the nineteenth car; we made three in 1845, two in 1846, seven in 1847, four in 1848, two in 1849, four in 1850, four in 1851, five in 1852; can't tell from 1852 to 1856.

Cross 46. What kind of brakes did you use on your cars previous to putting on brake like model Exhibit A?

A. A number of different kinds; I could not specify them; as I said before, we have been experimenting with different kinds of brakes, both on wheels and on the rail.

Cross 47. Did you use the single treddle brake on some of your passenger trains?

A. Yes; we used the treddle, the lever, and the crank.

Cross 48. On what proportion of the cars did you use the treddle brake?

A. I can't tell anything about it.

Cross 49. Did you put brakes like model A on all new cars for passenger-trains you built after June, 1843?

A. I think we did; I can't say positively.

Cross 50. About how many cars did you have said brake on, as near as you can tell, in 1850?

A. I can't say; I know we had it on two; how many more I can't say.

Cross 51. Did the cars that had these brakes on like Exhibit 380 A, run on the regular trains from Philadelphia to Jersey City?

A. Yes, sir, and on the trains to Amboy also.

Cross 52. Did you see a brake similar to model A, that was put on to a car in Jersey City on the New Jersey Railroad & Transportation Company, about 1851?

A. Not that I have any recollection of.

Cross 53. Did the cars of your company and the cars of the New Jersey Railroad & Transportation Company run on the same routes through trains from Jersey City to Philadelphia?

A. No, sir, on separate trains; each company made up their own train, but run on the same road.

Cross 54. If your cars needed repairs when at Jersey City, were they repaired there by the New Jersey Railroad & Transportation Company from 1842 to the present time?

A. I think not; at the first part of their running there they did no repairs at Jersey City; for the last fifteen years they done all slight repairs; when there was any work upon them of any account we done it at our shop at Bordentown.

Cross 55. Have they not done more or less repairs on your cars in Jersey City for twenty years or more?

A. I think not; but cannot say positively, nor don't pretend to.

Cross 56. Did the car John Taylor run on the route from Philadelphia to Jersey City from June 10, 1843, to 1852?

A. I can't tell that; we had several lines running; she may have run from Jersey City to Bristol, or from Camden to Amboy, or from Camden to New Brunswick. They changed passengers from New Brunswick at that time, and the cars did not run through to Jersey City.

Cross 57. Where did the crate-car you spoke of run?

A. I can't tell; it run through from Jersey City for some time, but can't tell when.

Cross 58. Which was the principal passenger-route from New York to Philadelphia in 1843 and thereafter?

A. I don't know.

Cross 59. Was there more passenger-trains and cars run through to Jersey City than to Amboy in 1843 and 1844?

381 A. I don't know; I had nothing to do with running trains.

Cross 60. How many times was the car John Tyler in your shop for repairs from June, 1843, to 1852?

A. I can't tell.

Cross 61. Was it in your shop for repairs several times during that period?

A. It was there once, I know; it was rebuilt in 1849.

Cross 62. You say you built three new passenger-cars in 1845; now, are you quite sure that a brake like Exhibit A was put on those cars when built?

A. I can't say positively.

Cross 63. Have you any distinct recollection when said brake was put on any car after June, 1843, to 1850?

A. Yes, sir; I think it was put on several; I am sure it was put on a baggage or crate car.

Cross 64. What circumstance is there to make you sure of putting it on a crate-car at any particular time?

A. I can't point out any particular circumstance; the crate-car at that time was the main car in the train for applying the brakes; the man rode on that altogether.

Cross 65. Then that is the reason you have for thinking the brake was on that crate-car before 1847, is it?

A. I couple with it that, as it was necessary to have the brake on the forward end of the train, where the man sits to overlook the train.

Cross 66. Why should that lead you to believe that the double brake was on that crate-car, while other crate-cars had then the single brake, and had had them on ever since the road commenced running?

A. At the commencement of the road we commenced with four-wheel cars, and that was the first eight-wheel car that was put on the road. That car was brought, also, from the Philadelphia and Trenton Railroad to the Bordentown shops, and there fitted up when the company bought out that road.

Cross 67. Did that crate-car run through to Jersey City between 1843 and 1847?

A. I don't recollect.

382 Cross 68. You have no distinct recollection of any particular time when said double brake was put on that crate-car, have you?

A. I can't specify any time.

Cross 69. Can you specify any time when said double brake, like Exhibit A, was put on any other car on the road between June, 1843, and 1847?

A. I can't specify any time.

Cross 70. Can you specify any year when said brake was put on a car between June, 1843, and 1847?

A. They were put on more or less every year from that time to the present.

Cross 71. Do you mean to say, then, that you put said double brake on a car in 1843, after June of that year?

A. No, sir; I do not, because I don't know. That car was an experiment, and I don't know how long it run before we commenced putting them on other cars.

Cross 72. Will you swear, positively, that you put said brake on any car in 1844?

A. I cannot; but I am under the impression that we did.

Cross 73. Can you swear that you put any of said brakes on in 1845?

A. I have said, heretofore, that I could not specify any particular time.

Cross 74. Can you swear, positively, that you put any of said brakes on in 1846?

A. I answer as I did before, that I cannot specify any particular time.

Cross 75. Can you swear that you put any of said brakes on in 1847?

A. As I said before, I cannot specify any particular time; I believe that we put them on from 1843, to the present time.

Q. Do you mean to swear, positively, that you put said double brake on any car from June, 1843, to 1848?

A. You have had my answer before.

Cross 77. What do mean by your last answer?

A. I don't mean to swear positively, as I said before; I believe that we put them on every year from 1843 to the present time.

383 Cross 78. Did you mean to swear, positively, that said brake was put on that crate-car before 1847?

A. To the best of my knowledge and belief it was; I think that is as far as a man ought to go.

Cross 79. Is it possible for you to be mistaken in the time?

A. It is possible for us all to be mistaken.

Cross 80. Did you mean to swear, positively, that said brake, like Exhibit A, was put on the car John Tyler in 1843?

A. To the best of my knowledge and belief, according to the testimony given.

Cross 81. Is it possible for you to be mistaken about that brake being put on that car at that time, and not at some future time, when that car was repaired or rebuilt?

A. I think not.

Cross 82. Do you mean, then, to swear, positively, that said brake was put on that car, John Tyler, in 1843?

A. To the best of my knowledge and belief.

Cross 83. Will you swear, positively, that the car John Tyler had said double brake on when it left your shop the first time you rebuilt the car and before you run it on your road?

A. To the best of my knowledge and belief it was, as I have sworn, to the best of my knowledge and belief; and would not go beyond that in case of life and death.

Cross 84. Was there any other car on your road called the John Tyler car between 1842 and 1850?

A. Not that I know or ever heard of.

Cross 85. Did not this car, called the John Tyler car, run to Jersey City, after June, 1843, with the single brake on it?

A. Not that I ever had any knowledge of.

Cross 86. Will you swear, positively, that it did not?

A. No; I will not. The brake might have been uncoupled and then it becomes a single brake.

Cross 87. Will you swear, positively, that that car, John Tyler, did not run on your road after June, 1843, with what is generally known as a single brake on?

384 A. To the best of my knowledge and belief, it did not.

Adjourned to the 1st August, at 11 a. m.

THURSDAY, *August 1st*, 1867.

Present, counsel for the respective parties.

Cross 88. Is it not possible for you to be mistaken about putting said double brake on the John Tyler when you first rebuilt it in 1843?

A. I think not, coupling it with all the circumstances.

Cross 89. What were the circumstances?

A. I have repeated them in this evidence two or three times, I think.

Cross 90. You say, in answer to interrogatory 79, it is possible for us all to be mistaken; does that answer apply to question 88, the first question this morning?

A. I don't think it does, under the circumstances; I having data to be governed by.

Cross 91. What data have you to be governed by?

A. From the time the car went out of the shop, and taking the President over the road.

Cross 92. Could not the car carry the President over the road as well with the single brake on?

A. As far as the carrying part is concerned, it would not make much difference whether it had any brake on.

Cross 93. What, then, has the President to do with the circumstances of your putting that brake on at that time?

A. Nothing, further than to establish the date.

Cross 94. How could that establish the date?

A. You will find that in my evidence, given heretofore.

Cross 95. What part of your evidence given heretofore do you refer to?

A. At the time the car came out of the shop, and taking the President over the road.

385 Cross 96. Is that all the reason you have for thinking the brake was put on in 1843.

A. That is what I take my data from.

Cross 97. Had you seen or heard of a brake like Exhibit A, before you put that one on the Tyler?

A. I never had.

Cross 98. You, then, claim to be the inventor of it, do you?

A. I do not make any claim whatever.

Cross 99. Who did invent it, then?

A. I don't know as it was an invention; it was an experiment.

Cross 100. Was that brake put on the John Tyler just like the Model Exhibit A?

A. I can't say that it was just like it; the principle was the same; there may be some difference in the minute parts. The coupling and the brakes are the same.

Cross 101. How do you know it was the same?

A. From the fact of its being in use at the present time.

Cross 102. Do you now remember distinctly the particular construction of that brake as put on the car John Tyler, at first?

A. To the best of my knowledge and belief it is the same as we are still using. As I said before, there may be some little difference in the minutiæ.

Cross 103. You have said that you had experimented a great deal with brakes; is it not possible for you to have changed or modified that brake after it was first put on the John Tyler?

A. Not materially, since we tried the cross-lever for coupling the brakes.

Cross 104. How many years ago since you think you put said brake on the John Tyler?

A. You can easily count up from 1843 to the present date.

Counsel for the defendant objects to any further examination as to questions which have already been answered, and to the introduction of any matter not involved in the direct examination.

Cross 105. It is then 24 years or more, is it?

386 A. I don't say anything more about it; it is a matter of calculation. I date from 1843.

Cross 106. Is your memory remarkably good?

A. It is as good as the generality of men.

Cross 107. Are your passenger and baggage cars now made with the side sagging down like Exhibit A?

A. The cars that I am now building of the Camben and Amboy Railroad are not; they have straight sides.

Cross 108. How are the cars you are now using?

A. They are made of different shapes and different finish from the cars we formerly built.

Cross 109. How is the majority of your passenger-cars as regards the sagging of the sides?

A. I don't think that has anything to do with the brakes. The car-body you can construct in any form you like. We have built cars with deep sills to give them strength and to obviate any difficulty of putting a strengthening-piece inside the car, as we thought it would be attended with difficulty in the car rotting by the water getting behind it, and we find by actual experiment we can overcome that difficulty by putting a water-table back of the sub-sill, and between the pillars, and then putting them together with white and red lead to keep the water from penetrating, consequently we have no rot.

Cross 110. From 1842 to 1850 were your cars built with the sagging down, like the model Exhibit A?

A. The first car-body built in the form of Exhibit A was built in 1849.

Cross 111. Do you know where the model Exhibit A was made?

A. It was made at Bordentown, in the Camden and Amboy shops.

Cross 112. Under whose direction?

A. Under the direction of Robert Van Renssalaer.

Cross 113. Who made it?

A. Three or four different individuals worked on it.

Cross 114. Did you give them any directions as to how to make it?

A. I did according to instructions from Robert Van Raussalaer.

387 Cross 115. What instructions did M'r Van Rensalear give you?

A. He directed me to make it in conformity with the John Tyler as near as I could; I told him I could not do that, as the John Tyler had a narrow sill; there was not strength to hold the body up, as the sills would sag; he did not apprehend that it would make any difference what form the sills were, as the car-body had nothing to do with the brake.

Cross 116. Did you give the man who made the model instructions to arrange the brake as is shown on said model?

A. I told him to make the brake conform to the brake we have in use as far as the connections are concerned; the former brake-blocks were wood, being leathered, but latterly we use iron altogether.

Cross 117. What kind of a brake did the car John Tyler have on when it was first brought to your shop?

A. That I have no distinct recollection of; I can't say whether it had any on or no; I suppose it had some kind of a brake on.

Cross 118. What kind of brakes were generally used on the Philadelphia and Trenton cars before your company bought them; were they not the single-treddle brake generally?

A. I can't tell; I had no knowledge of the cars at all, as we had no connection with the road before then.

Cross 119. Did not their cars come to your shop for repairs after your company bought them?

A. They did after our company bought them, and we rebuilt them, but not before.

Cross 120. When did your company buy them?

A. That I have no knowledge of.

Cross 121. Was it before or after you first rebuilt the John Tyler?

A. I should judge it was before; if it had not been, the car would not have come to the shop.

Cross 122. Then, sir, have you no recollection as to what kind of brakes were on those cars when they come to your shop to be rebuilt or repaired?

388 A. I have no data or reference to the cars, until we put the Tyler on the road.

Cross 123. Do you think any of these cars had on the treddle-brake when they came to your shop first?

A. I think I have answered that question once before.

Cross 124. Why do you recollect more distinctly the John Tyler car than of any others?

A. I think I have answered that question before.

Cross 125. Question repeated.

A. Coupling the circumstance of putting the car on the road and taking the President in it on the 10th of June.

Cross 126. How long did you use the brake like Exhibit A, before you became satisfied that it was a great improvement on the brakes you had previously used?

A. I was satisfied from the moment of its first application.

Cross 127. Then, if you had used it a year or two before building other cars, you would, of course, have been likely to have put it on other cars when they were built, would you not?

A. No, sir, that does not hold good, for the reason that I have had the priviledge of trying experiments for the last thirty years, subject to the instructions of the superintendent whether he would adopt them or no; as we tried experiments of different things, and had them on the road in use to my satisfaction, but had not authority to adopt them only by instructions from the superintendent.

Cross 128. Did you have authority from the superintendent to adopt the brake like Exhibit A; if so, when?

A. If I had not I should not have put it on; I can't give any specified time when he authorized me to put them on.

Cross 129. Was it during the year 1843 or 1844?

A. You have my answer before; I can't specify any time particularly.

Cross 130. Do you think it was within three years after the brake was put on the John Tyler?

A. I think I have answered it before.

389 Cross 131. Have you now any distinct recollection of putting that brake like Model A on the car John Tyler in 1843 aside from the circumstance of the President's riding on that car about that time?

A. I say, as I said before, that to the best of my knowledge and belief that that brake was on said John Tyler in June, 1843.

Cross 132. Question repeated.

A. I tell you, I have no way of going beyond my knowledge and belief.

Cross 133. Do you mean to be understood that all of your answers to previous questions, both direct and cross, are from your knowledge and belief, and not positive?

A. To the best of my knowledge and belief, accompanied with the circumstances which transpired at the time, and of which I have data.

Cross 134. How do you know that the engineer's time-book you spoke of yesterday is correct?

A. I believe it to be correct from the deportment of the man; he has been the timekeeper of the company ever since 1840.

Cross 135. Do you know that those dates were written in the book at that time?

A. I don't know it to my certain knowledge, but you can satisfy yourself of that by calling the timekeeper.

Cross 136. You said yesterday that you had built thirty-one new cars for passenger-trains from 1844 to and including 1852; now, do you think, or is it your impression, that you put on brakes like Exhibit A on all those cars when you built them?

A. I think I stated yesterday that we put on all those years; that is my impression still; I don't think I put them on all the cars, for the reason that I did not have instructions so to do.

E. LOCKWOOD.

Subscribed and sworn to before me this 1st day of August, 1867.

R. E. STILWELL, *Examiner, &c.*

390 GEORGE W. THOMPSON, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. George W. Thompson, 47 years of age, reside at Bordentown, New Jersey, and am a tin, sheet-iron, copper, stove dealer, &c.

Q. 2. Have you occupied any position in the city government at Bordentown and in the State legislature of New Jersey; if so, when did you hold such position or positions?

A. I have been mayor of Bordentown for six different terms; I have been six years a member of the board of freeholders representing that county from our district, and have been a member of the legislature of the State for two successive terms, and am a member at the present time.

Q. 3. Have you had business relations with the Camden and Amboy Railroad Company; if so, state in what way, and to what extent, and how long?

A. I have had connection with them, in the way of business, since 1841 and 1842; I have done the principal part of the work on their cars, the tin trimmings, stoves, roofing, ventilators, lanterns, blowers, zincing, and water-tanks, waste-boxes, journal-boxes, &c., &c., up to the present time.

Q. 4. Do you know anything about a car called the John Tyler; if so, did you have anything to do in furnishing the trimmings for said car?

A. Yes, sir; I furnished all the trimmings for it and done the work myself.

Q. 5. While so engaged, did you notice what kind of a brake was applied to the said Tyler car at the time you did this work?

A. I did.

Q. 6. Is the brake, as seen in Exhibit A, a correct representation as applied to the said car called the John Tyler?

(Objected to as leading.)

391 A. It is, as near as I can remember.

Q. 7. Was said brake a double-acting brake?

A. It was.

Q. 8. Did it have a centre lever attached to the body of the car, equidistant from the trucks?

A. I think it had; I don't know how near the centre it was; it was similar to Exhibit A.

Q. 9. And did this centre lever so combine the brakes of the two trucks and the windlasses of the car as to enable the brakeman to operate both brakes of the trucks from either end?

(Objected to as leading.)

A. It did; and it was the first one I ever saw that done it.

Q. 10. In what year did you see this brake?

A. It was in June, 1843.

Q. 11. How do you determine the date? Please state the circumstances connected with the matter of your first knowledge of it.

A. We all had more or less fancy work to do on it. The President was to go over the road in it to the celebration of the Bunker Hill Monument, and it was supposed to be the greatest car in the United States, or ever would be, at that time; the date was the 10th of June, 1843, when the car was used for this purpose; the celebration was on the 17th of June, I think; I got the date of the 10th of June from the books of the company; I knew it was in June, but did not remember the date.

Q. 12. Was it a favorite car among the conductors of the Camden and Amboy road; and, if so, why?

A. Well, sir, they all wanted to run it, and it was considered at that time what we would call at the present time a silver-palace car; it was way above all other cars, and had all the improvements of the day; it had twelve wheels, spiral springs; it had the lever brake put on, and worked at either end of the car, similar to Exhibit A.

392 Cross-examined by Mr Sayles, the plaintiff, in person:

Cross 13. Did you notice this John Tyler car often after it commenced running in 1843?

A. Yes, sir; I used to often take notice which line it was on, and could always tell it when on any of the trains; it was very different from any other car in appearance.

Cross 14. Was the construction of it different from other cars; and, if so, in what respect?

A. Only in appearance, finish, &c.

Cross 15. Was it different from most of the other cars on the platform or entrance to the car?

A. I don't remember any particular difference there; whether they entered from the side door or the end I am unable to say.

Cross 16. How long since your attention was called to this car John Tyler?

A. About two months ago.

Cross 17. Who called your attention to it?

A. Mr. Lockwood, the witness in this case. He asked me if I remembered anything about the old Tyler car, and I said I thought I did. I told him I thought she came out in 1842 or 1843, as I could remember. He asked me then if I remembered about the brakes on the car, (I didn't know then that there was any trouble at all). I told him that I recollected distinctly that the brakes operated from either end of the car and hung in the centre, and I told him that it was the first I had ever seen. He told me then that I would have to be a witness in this case. That was about all the conversation we had about the matter at that time. Since then he has shown me the books of the exact date at which the Tyler went through.

Cross 18. You said you had had the trimming of all their cars from that time to this, did you?

A. Yes, sir; I have furnished and manufactured the trimmings and put them on the cars until within the last three or four years; since that time I have only manufactured and furnished the trimmings, and they have men to put them up themselves.

393 Cross 19. How many times have you furnished trimmings for the car John Tyler, and put them on?

A. I don't remember except twice. She got broke up once, and they rebuilt her, and I furnished trimmings and put them on at that time, and when she was first built, and may have done so several times afterwards, but don't remember positively. At that time I done all the work, and put it up myself.

Cross 20. When was it rebuilt a second time?

A. About 1849, I think.

Cross 21. How do you know about 1849?

A. I remember her being broken up by an accident, and rebuilt, I think, about 1849.

Cross 22. Where was that accident?

A. I think it was near Old Bridge, in New Jersey, near Amboy.

Cross 23. How do you know that it was in 1849?

A. I remember its being five or six years after she came out. I have no data to establish the exact time. It may be in the books and it may not. I did not look, as it was immaterial.

Cross 24. Did you hear M'r Lockwood say it was in 1849 when it was rebuilt?

A. He never told me what time it was, and I never inquired. It was never mentioned between us.

Cross 25. Did you hear him testify as to that time here yesterday?

A. I really don't know whether he testified to that when I was in or not. I was in and out when the testimony was being taken, and I was not paying any particular attention. I was reading a part of the time.

Cross 26. You said in your direct examination that the car John Tyler had a double brake on; please describe what is known as a double brake.

A. I will do so as near as I know how. The term that I meant to use for a double brake is a brake connected in the centre of the car with a lever, so that the application can be made at either end of the car upon the brakes of the two trucks. I say further that I am not a car-builder, and don't know the phrases used by car-builders.

394 Cross 27. Did you notice this double brake on any other car about that time?

A. No, sir; I am under the impression that it is the first one they ever put on of that description.

Cross 28. Why do you think that was the first one?

A. My attention was called to it by men in the shop. My attention is generally called to any improvements for the cars by the bosses and foreman. I am generally careful to take notice of all the improvements connected with cars on railroads, and have been in the employ of M'r

Edwin A. Stevens, the former president of the road, ever since I was 15 years of age.

Cross 29. Do you recollect the Stevens and Hodge brakes when they were put on that road?

A. No, sir.

Cross 30. Do you recollect any other brake being put on that road?

A. I don't recollect when they were put on. I remember seeing other kinds of brakes; treddle-brakes and lever-brakes.

Cross 31. What other car do you recollect seeing this brake on, like Exhibit A, after June, 1843?

A. I could not particularize any one car at all. The brake has finally drove all others out; I know that. Neither could I have pointed the one out like Exhibit A, if it had not been the first one I had ever seen, and the car that it was attached to being a matter of curiosity is all the reason why I can tell it was there, it being the first one I had ever seen.

Cross 32. How soon after it was put on the Tyler car do you recollect it being put on any other car?

A. I don't remember any particular time. I cannot say.

Cross 33. You say it drove all other brakes out; how soon did it drive all other brakes out?

A. I don't think they have used any other kind for a number of years. I could not specify any particular time when the rest were drove out.

Cross 34. Do you recollect seeing it on any other car previous to 1847?

395 A. Yes, sir; one of the crate-cars that carries the baggage-crates.

Cross 35. Did that crate-car run in the train with the Tyler car?

A. It may have done so before now. They generally made that crate-car up in through lines, sometimes to Amboy, and sometimes to New Brunswick. The Tyler car was not constantly used when it first came out. They used to lay it away for big occasions. The conductors used to brag about it, and we generally knew it, us men who were connected with the road.

Cross 36. When that crate-car run through to New Brunswick, did they change cars there, or did they run it through to Jersey City?

A. I did not travel on that road enough to know at that time.

Cross 37. How do you know, then, that it run through to New Brunswick?

A. I don't know, only I have seen it in through trains that were coming this way.

Cross 38. About how early a date can you fix when you saw this brake on that crate-car, which you say you saw on before 1847?

A. Well, sir, I can't say positively; several months afterwards. I won't state any time.

Cross 39. Several months after what?

A. After the Tyler car came there.

Cross 40. Do you recollect the number of this crate-car?

A. I do not. They are all numbered.

Cross 41. Now, can't you recollect whether the double brake, like Exhibit A, was put on the new cars that were built by that company after the Tyler car first came?

A. No, sir; I do not know. The novelty had worn off the matter, and I cannot state any particular time.

Cross 42. Do you recollect whether the said brake was on the said Tyler car when you trimmed it in 1849?

A. Yes, sir; it was.

Cross 43. How was that car broken up before it was rebuilt in 1849?

396 A. By a collision. One train running into the other.

Cross 44. What condition was the car in before it was repaired in 1849?

A. I don't remember whether the roof was torn off, the side smashed in, or the end broken in. I have seen so many of these cripples.

Cross 45. Then you recollect, do you, that the brake like Exhibit A was put on this car again after it was rebuilt in 1849?

A. I think it was.

Cross 46. And you do recollect whether it was put on any other passenger cars or not before 1847?

A. I do not recollect particularly; the novelty had then worn off. I don't know whether M'r Lockwood used any other brake after that. I think he put it on all new cars after that, and all that were repaired. I have known of others try experiments there, but did not take any particular notice.

Cross 47. Was there a great deal said about this double brake at the time it was put on the car first? I mean, was it talked about by railroad men as being a great improvement?

A. There was more or less talk about it around the shops amongst us all. They seemed to think it was about what was wanted.

Cross 48. Do you recollect any other particular kind of brake put on there called the McLoughlin brake; and, if so, when?

A. I remember such a brake being around there. I don't remember the construction of it, nor when it was put on, or whether it was put on at all or not. I am unable to say.

Cross 49. Do you recollect whether it was before or after this brake was put on the John Tyler that you heard the McLoughlin brake spoken of?

A. I think it was several years afterwards, if my memory serves me right.

Cross 50. About how many years, as near as you can judge?

A. I don't think I could guess within five years.

397 Cross 51. Can you say positively that you saw this double brake, like Exhibit A, on any passenger-car, except the Tyler, before the Tyler was rebuilt, in 1849?

A. I can say, as positively as I think a man can say about anything of that kind, that I have.

Cross 52. Do you think it possible that you may be mistaken about seeing it on one of the cars before 1849?

A. I don't think I am mistaken about that; I don't see how it could be possible for me to be mistaken about a matter of that kind.

GEO. W. THOMPSON.

Subscribed and sworn to before me this 1st day of August, 1867.

R. E. STILWELL,
Examiner, &c.

NICHOLL F. SMITH, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Nicholl F. Smith; 56 years of age; reside at Bordentown, State of New Jersey; and am a car-builder.

Q. 2. Have you been in the employ of the Camden & Amboy Railroad Company; if so, when and how long were you so employed?

A. I went to work for them in 1845, on the 19th day of November, I think, and have been employed by them in different capacities about 20 years.

Q. 3. What kind of work was you set to do when you first went into the employ of said company in the year 1845?

A. Repairing cars and building new ones.

398 Q. 4. Did you have occasion to do any repairs on a car called the John Tyler; if so, what part of said car did you work on and what were the circumstances connected with said work?

A. I was ordered to work on the John Tyler; a man by the name of Vandergrift was ordered with me to take the trucks out; I had occasion to go under the car before we could get the trucks out and unhook the brake, which was like the model Exhibit A.

Q. 5. Please describe said brake?

A. It was a double acting brake, as near like model A as I can recollect; it was the same thing.

Q. 6. Do you know of the application of the brake as seen in Exhibit A to any other cars of the Camden & Amboy Railroad; if so, please state of your knowledge of the use of said brake from 1845 to the present time.

A. Some time after that there was a crate-car came in the shop to be repaired, it was some time during that winter and before the spring, with the same brake on her as on the model A, or Tyler car; the brake became in general use some time after that.

Adjourned to 10 a. m., the *the* 2d instant.

FRIDAY, *August 2d*, 1867.

Present, counsel for the respective parties.

Q. 7. How do you fix the time of entering the employ of the Camden & Amboy Railroad, which you say was in the year 1845?

A. I fix it by the shop time-book of the company (and the witness here presents a book purporting to be the time-book kept in the shop of the Camden and Amboy Railroad Company, and says that his name appears upon it under date of December 19th, 1845, and says that is the time to the best of his knowledge); the only way I can get at the time is by the books of the company.

Q. 8. Do you mean by that the exact time to a day?

A. I do.

399 Cross-examined by M'r Sayles in person:

Cross 9. Do you know the time referred to in the book is correct?

A. I believe it to be so.

Cross 10. Do you know of your own knowledge that it is correct?

A. To the best of my belief and other circumstances, it is. I have a deed at home, which I forgot to bring with me, of property which I bought that fall; I moved to Bordentown that fall, and it was at that time I bought the property.

Cross 11. Did you not give a statement a few months ago, in writing, of what you knew concerning this brake being on the car John Tyler in 1845, and in that statement did you state the time you bought this property in Bordentown?

A. I think it likely I gave such statement, and think it quite likely I stated about the purchase of the property in Bordentown.

Cross 12. Did you not in that statement say that you purchased that property at some other time than the fall of 1845?

A. I don't recollect it; I hadn't the deed with me when I gave the statement; it was mere verbal, and I looked at the deed afterwards.

Cross 13. Did you mean the crate-car you spoke of was brought in the shop for repairs (with a brake on like Exhibit A) in the winter of 1845 and 1846?

A. It was along during that winter; it might have been as late as February.

Cross 14. Did you help build any new passenger and baggage cars for the Camden and Amboy Company in 1845 and 1846?

A. I don't recollect of any; I was working on repairs.

Cross 15. Was this brake like Exhibit A put on other cars as they were repaired during the years 1845 and 1846?

400 A. They were not generally put on; they might have been put on new passenger cars; they came into use gradually, and in a few years they had them on most all of them.

Cross 16. About how many years, as near as you can tell, before they had them on most all of them?

A. I could not tell; probably from two to ten years.

Cross 17. Do you think they had them on the majority of their passenger and baggage cars as early as 1850?

A. I can't tell whether they had or not; they might and they might not.

Cross 18. Did you ever have occasion to repair the Tyler car after the fall of 1845?

A. I have worked on it after that.

Cross 19. At what time?

A. I can't tell; a few months, it might have been longer.

Cross 20. Was that car often repaired in the shop?

A. No more than any other.

Cross 21. Was it not in the shop for repairs a number of times before 1850?

A. It might have been.

Cross 22. Did you help rebuild it in 1849?

A. I might; I can't recollect whether I did or not.

Cross 23. Did you often have occasion to take the trucks out from under passenger and baggage cars when repairing them?

A. I did.

Cross 24. How long did you work at repairing cars?

A. At new and repairing, about twelve years from 1845, to the best of my knowledge.

Cross 25. Did you, during that twelve years, often have occasion to go under the cars and unhook the brake in order to get the truck out?

A. Not always; they had not all that kind of brake on; for a single brake there is no occasion to go under.

Cross 26. Did you several times during that period have to do so?

A. I might more than that and I might not as much.

Cross 27. When was your attention first called to this brake like Exhibit A?

401 A. Within a few days after I commenced working with the company.

Cross 28. Has your attention been called to this brake matter within the last year? If so, when and by whom?

A. Edwin Lockwood first asked me if I recollected the Tyler car; this was about five months ago.

Cross 29. How long before that had you thought particularly about this brake being on the Tyler car in 1845?

A. I don't know that I can specify any time.

Cross 30. Had you for a number of years before?

A. I had seen them for a good many years in use of the same kind.

Cross 31. You had often repaired cars, then, with these brakes on, had you?

A. Yes, sir.

Cross 32. Do you remember of other double-acting brakes being used on the Camden & Amboy cars?

A. I have seen them since I left the shop several different times.

Cross 33. When did you see them; what year?

A. I saw them about a year ago, I think.

Cross 34. Did you ever see any there before that?

A. I might.

Cross 35. Do you now remember ever seeing any there between 1845 and 1855?

A. I don't remember ever seeing any double brake during that time, except the one like Exhibit A.

Cross 36. What did you do for that company after the first twelve years?

A. Superintended a section of the track, between Bordentown and New Brunswick.

Cross 37. During what years?

A. I can't tell exactly just now. I can't tell at all; I have nothing to go by. I would guess it was about six years ago, and acted in that capacity from six to eight years.

Cross 38. Is it possible for you to be mistaken about this brake, like Exhibit A, being on the Tyler car when you first repaired it, and not at some future time?

A. It is possible I might, but I don't think I am.

402 Cross 39. Is it possible for you to be mistaken about said brake being on the said crate-car you spoke of in the winter of 1845 and 1846, and not some other time?

A. It is possible I might, but I don't think I am.

Cross 40. How was this Tyler car constructed? Was it different from other cars then in use on that road? If so, in what respect?

A. It had several different kinds of seats in it; a panel cut out of the end of the car to put a light in it. There might be other differences, but I don't recollect.

Cross 41. Was the general appearance of the car outside quite different from the other cars at that time?

A. It was.

Cross 42. Please state the differences.

A. It had six-wheel trucks, different springs, two different kinds, both spiral and elliptic; it had a different brake, painted up a little more fancy, and a better-looking car altogether in its outward appearance, likewise in the interior, than any other car on the road.

Cross 43. At the time you saw this brake, like Exhibit A, did you hear it spoken of by the railroad men in the shops generally as being a great improvement on the single brake?

A. In this way. I asked how it was different from the others—that is, the single brake—and they said it was an improvement on the single brake.

Cross 44. Did you often see the car John Tyler?

A. I did, when it came in the shop for repairs, and sometimes on the road in the train when it passed the shop.

Cross 45. Did you often see it in the train while you were superintending a section of the track?

A. I used to see it once in a while. I don't think it was run regular. I am not positive that I saw it at all. I might and I might not.

Cross 46. Do you know who was at the expense of making Model Exhibit A, or have you heard Edwin Lockwood, the witness in this case, say who paid the expense?

A. I think I heard him say that the company did. I didn't 403 understand him to say the Camden & Amboy Railroad, but he might have meant that.

N. F. SMITH.

Subscribed and sworn to before me this 2d day of August, 1867.

R. E. STILWELL,
Examiner, &c.

LETCHWORTH COX, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Letchworth Cox; 53 years of age; resides at Jamesburgh, New Jersey. I am a car-builder and repairer of cars.

Q. 2. In the employ of what railroad company are you now engaged? How long have you been in such employ?

A. In the employ of the Camden & Amboy Railroad, and have been in their employ since 1838.

Q. 3. Where on their lines were you employed by them in 1847?

A. At Amboy.

Q. 4. Do you know anything about the use of a double brake on a car or cars of that road at any time during the year 1847? If so, state what you know, and give the particulars connected with such knowledge.

A. I do. In the year 1847 I saw a double brake on a crate-car that came to Amboy, where I was engaged. It was a brake connected in the centre by a cross-lever, with a rod running from it to the brake lever, and another rod from the centre lever to each end of the car attached to an upright shaft on each end of the car. On each end of the car there is a rod running from this lever which was in the centre of the 404 car; also, there was a rod running from the lever to the brake, lengthwise, that connects the brakes together. I have begun at the wrong end to describe it, and will now commence with the cross lever first. A rod was attached to the cross-lever running to each end of the car, attached to an upright shaft; a rod was attached to the centre lever which connected with the brakes. That is about all the particulars I can say about it. (The witness evidently confused.)

Q. 5. The witness is now presented with the Model Exhibit A, and he is asked whether that is such a brake as he wished to describe?

A. Yes, it is.

Q. 6. Did this brake apply the power of the brakeman to both trucks of the car at the same time and from either end of the car?

(Objected to as leading. Plaintiff objects to showing witness the model, inasmuch as he has not explained the brake.)

A. It did.

Q. 7. How do you fix the date of your seeing this brake which you have described on the crate-car which came to Amboy?

A. By the age of my son. I was at work on the brake on that day, and was called away. I had to get it ready that night, as the car had to go out next morning.

Q. 8. Where were you called?

A. I was called to go for the doctor to attend my wife, who was sick.

Q. 9. Was there at that time born to you a son? If so, at what date was he born?

A. There was; it was on the 27th day of February, 1847.

405 Cross-examined by M'r Sayles in person:

Cross 10. Are you sure that the brake on that crate-car in 1847 was exactly like Exhibit A?

A. The principle was exactly like it; there might be some small variations; I couldn't say exactly about that.

Cross 11. When did you commence working at Amboy for that company?

A. It was at the end of 1845 or the first of 1846; somewhere along there.

Cross 12. What was your particular business there?

A. To look after cars and see if they were all in running order, and if they were not to have them taken out.

Cross 13. You had to examine the trains, then, when they came in, to see if they were in running order?

A. Yes.

Cross 14. That was the first time you had seen such a brake, was it?

A. No, sir.

Cross 15. When and where did you first see such a brake?

A. I can't give the date when; but it was before then at the Bordentown shop.

Cross 16. Was that the first you saw of such a double brake at Amboy?

A. I could not say positively about that.

Cross 17. Have you any recollection of seeing said brake at Amboy before 1847?

A. I can't say positively that I ever did.

Cross 18. Did that crate car run regular on that line to Amboy, or did it run to Jersey City part of the time?

A. I cannot say. It did not come to Amboy every day. Sometimes it came in a few days and sometimes in a week.

Cross 19. How often would a car come to Amboy when it run regularly on that route?

A. Every day.

Cross 20. Did you often have occasion to repair cars that had on the double brake, at Amboy, after February, 1847?

406 A. I never had anything to do with repairing more than a bolt or so; I marked them for repairs, and sent them off to the shop at Bordentown.

Cross 21. Did you often see cars at Amboy with this double brake on after February, 1847?

A. I frequently did.

Cross 22. Did that company have such long crate-cars attached to all of their passenger trains that run to Amboy in February, 1847?

A. I think not all of them; some of them which came in at night hadn't.

Cross 23. Now, sir, have you a distinct recollection of the construction of the brake that you say you saw on that crate-car in February, 1847, or have you described it from seeing Model Exhibit A, or from having seen it on other cars within the last year?

A. I believe I have a distinct recollection of it.

Cross 24. Did they have a brake-house on that crate-car on one end, for the brakeman?

A. No, sir.

Cross 25. Are you positive that that crate-car could be broke, or the brakes applied from either end of the car to all of the wheels of said car simultaneously?

A. I am positive.

Cross 26. Is it not possible for you to be mistaken in seeing this double brake on that car in February, 1847; might it not have been at some time thereafter?

A. It was in 1847.

Cross 27. Were there more passenger-trains run on that line to Amboy, from 1845 to 1850, than on the other line to Jersey City?

A. I could not say; I did not see the other trains.

Cross 28. What called your attention to this brake in February, 1847, as you have stated?

A. One of the rods was broken.

Cross 29. Did the rods often break on the brakes of the cars?

A. Not very frequently; sometimes they did.

Cross 30. About how many times do you think they would break in the course of a year?

A. I could not say.

407 Cross 31. Can you swear that you did not find them broken on the cars as many as twelve times in a year?

A. I could not pretend to say anything about that; I won't swear that they didn't or did.

Cross 32. Did you often see the car John Tyler at Amboy, from about the time you went there to 1850?

A. Not very often; she was there sometimes.

Cross 33. About how often do you recollect seeing her there?

A. That I could not say.

Cross 34. Do you think she was there as often as once in two weeks from 1845 to 1850?

A. I could not say positively about that.

Cross 35. During that time did the Tyler car run on the Jersey City line most of the time?

A. I could not say; but think she did, as she didn't come to Amboy often.

Direct resumed by M'r Whipple:

Q. 36. In answer to the 15th cross-interrogatory, you say that you had seen this double brake at Bordentown before 1847; on what car or cars did you see it, and where did you see it?

A. I saw it on a car which was afterwards called the John Tyler car; she was not named at that time.

Q. 37. (Witness is shown Model Exhibit A, and asked to point out the rod that broke, as stated in his 28th cross-interrogatory, and which he mended, and by which he identifies the brake.)

A. The witness points out the rod, and says that it is the rod that connects the brakes with the cross lever.

Q. 38. Do you mean to say that it is the rod which connects the upright lever in one of the trucks with the cross lever attached to the body of the car?

(Objected to as leading.)

A. I do mean to say so.

408 Cross-examined by M'r Sayles:

Cross 39. At what point was that rod broken?

A. Near the cross lever, in the centre of the car.

Cross 40. About how many feet from the cross lever?

A. I didn't measure it, but I should think from six to eight inches from the cross lever.

LETCHWORTH COX.

Subscribed and sworn to before me this 2d day of August, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to the 6th inst., at 10 a. m.

TUESDAY, *August* 6, 1867.

Present, counsel for the respective parties, as before.

WILLIAM VENABLE, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. William Venable; 52 years of age; reside at Bordentown, New Jersey, and am a car-builder.

Q. 2. By whom are you now employed, and how long have you been so employed?

A. By the Camden & Amboy Railroad Company, and have been so employed from 1838 to 1840, and from 1847 to the present time.

Q. 3. How were you employed from 1840 to 1847?

409 A. I was employed the first two years in coach-making; from March, 1843, to June 1st, 1843, I was at work at M'r Stevens' house, at Hoboken; from June 1st to the 28th of August, 1843, I was then at work in building crates, and on carpenter's work; on August 28, 1843, I went to work for M'r Edward Lockwood, in building and repairing cars in the Camden & Amboy shops, at Bordentown, and have continued there until the present time.

Q. 4. Do you wish to be understood that you commenced work for the Camden & Amboy Railroad on the 28th of August, 1843, and continued to the present time, or, as you have already stated, from 1847 to the present time?

(Objected to as leading.)

A. I wish to be understood that I commenced working for them on the 28th day of August, 1843, and have continued with them to the present time.

Q. 5. Is there any event or circumstance which took place in Bordentown, in June, 1843, that you now remember as having taken place in that month. If so, state that event.

A. On June 10, 1843, I saw John Tyler, President of the United States, pass through Bordentown on his tour to Bunker Hill monument. I recollect of his being in a certain car that was afterwards named John Tyler.

Q. 6. Did you know, at that time, what kind of a brake was on the said car, afterwards called the John Tyler?

A. I did not, at that time.

Q. 7. Did you know at any time thereafter? If so, state, as near as you can recollect, when, and the circumstances connected with it.

A. I think in the latter part of the year 1844 I was called upon to repair the trucks and brake of that car, and I noticed the cross-lever attached to the body; and the reason I noticed it more particularly, was on account of its being connected with an upright lever attached to the truck. It was necessary, therefore, to unconnect the rod attached to each lever in one truck, that the trucks might be taken out from under the car.

410 Q. 8. Do you mean the lever in the truck or each lever in the truck?

A. I mean the upright lever in each truck.

Q. 9. (Witness is now shown Model Exhibit A, and asked) Is this a correct representation of the brake as applied to the car John Tyler, spoken of by you? If so, point out on the cross-lever of this model where you disconnected the lever in the truck from the cross-lever under the body of the car.

(Objected to as leading.)

A. I disconnected it from the upright lever attached to the brake-bar of the truck, and from the upright lever at the other end of the car.

Q. 10. And did you disconnect the rods from the windlasses connecting the cross-lever with the same?

A. No, sir; it was not necessary to do so.

Q. 11. What name do you give to this cross-lever brake?

A. The back-action brake.

Q 12. By that do you mean a double brake?

A. I do.

Q. 13. Do you know of the use of this brake on any other car or cars on the Camden & Amboy road before the year 1847?

A. I do, on a crate-car.

Q. 14. Is this brake in general use on the cars of the Camden & Amboy road at the present time?

A. It is.

Cross-examined by M'r Sayles, the complainant, in person:

Cross 15. Where was this John Tyler car when you first saw it?

A. When I first saw that car to notice it, I think it was when he, the President, was first carried through Bordentown, June 10th, 1843.

411 Cross 16. How do you know it was June 10th, 1843?

A. I take the engineer's time-book for the date.

Cross 17. Is that all the reason you have in knowing that it was on that day?

A. That is all the reason I can give of the date for its being on that day.

Cross 18. Do you know of your own knowledge that the engineer's book is correct?

A. To the best of my knowledge and belief, I do.

Cross 19. Did you see those dates put down in the book at that time?

A. I did not.

Cross 20. Do you know that the engineer himself put them down at that time?

A. I do not.

Cross 21. Please describe the peculiar construction of that John Tyler car, wherein it differed from the other passenger-cars on the road at that time.

A. The John Tyler car at that time was a plain-looking car with end doors, a lamp out through the panel at each end of the car. It had different kinds of chairs or seats; it had also elliptic springs, and spiral springs and springs within springs.

Cross 22. Had this car simply a plain door on the platform where you entered the car, or was there some kind of an entry or vestibule?

A. Nothing but a plain common panel door.

Cross 23. Did you often have occasion to repair cars that had on double brakes, like Exhibit A, from August, 1843, to 1850?

A. At times we had some of those cars to repair, taking off the single brakes and attaching the double brakes, like Exhibit A.

Cross 24 On what route was the John Tyler when you first saw it?

A. When I first saw it, as I said before, it was at the Bordentown station. At that time, I think, it went to New Brunswick. They did not run them through as at the present time. They changed at New Brunswick.

412 Cross 25. Did they change their baggage also at New Brunswick at that time?

(Objected to, for the reason that the witness is not supposed to know anything about it, being a car-builder.)

A. That is more than I am able to say; I had no occasion to travel, and therefore cannot say.

Cross 26. In M'r Edwin Lockwood's testimony, taken in this case last week, the following question was asked him on direct examination in question No. 5: "Was the brake referred to applied to other cars on the Camden & Amboy Railroad; and, if so, to what extent?" Answer. "They were applied to other cars. We also applied it to a crate-car for carrying baggage. Directly after that we continued then putting it on all our cars for passengers and baggage use as we could spare them off the road. Our cars at that time were very limited, and when we took any of them in for repairs we applied the brake." Now, after you went to work for the Camden & Amboy Company in 1843, was this double brake, like Exhibit A, put on all the passenger and baggage cars as they came in the shop for repairs, and on new cars that were built?

A. They were put on after 1844; perhaps some time in the latter part of 1844. After that they were put on the cars as they were cleaned up or repaired, and also on the new cars as they were built.

Cross 27. When did you first see this brake on the John Tyler car?

A. As I stated before, in the fall of 1844, when I repaired it.

Cross 28. This being the first car that brake was put on, and its being a great improvement on the old single brake, as has been testified to by the other witnesses in this case, was there not considerable talk about it by the hands in the shop, as being something new, at the time when you first saw it?

413 A. There was some considerable talk amongst them about its being a great improvement on the single brake.

Cross. 29. Do you recollect any other double brake or brakes being tried on that road at any time; and, if so, when?

(Objected to, for the reason that it is the introduction of matter not involved in the direct examination.)

A. I do recollect other double brakes tried on the cars on that road, but can't the date.

Cross 30. About what year were they so tried?

(Same objection repeated.)

A. I am not able to give any date as to the year.

Cross 31. Was it between 1843 and 1847?

A. I should say not.

Cross 32. Was it between 1846 and 1850?

A. I should think not.

Cross 33. Are you sure that it was not before 1847?

A. I am to the best of my knowledge and belief.

Cross 35. What were those other double brakes you speak of called? (Objection repeated.)

A. There was one called the Hodge brake, also one called the Stevens brake.

Cross 35. Are you sure that those brakes were not tried there before 1850?

A. I am, to the best of my knowledge and belief.

Cross 36. Do you think they were put on the cars there in 1850 or 1851?

A. I did not see any put on.

Cross 37. Do you know of any being put on in those years?

414 A. I don't know when they were put on. I have seen the cars with the brakes on. I believe other parties put them on themselves to try the experiment.

Cross 38. What other parties put them on?

A. I mean those concerned in the brakes. M'r Lockwood would not have much to do with those things.

Cross 39. You have referred now, have you, to the Hodge and Stevens brakes you have spoken of?

A. I have.

Cross 40. When did those parties put those Hodge and Stevens brakes on the cars; when was the work done, and by what workmen? (Objection repeated.)

A. The work was done at the Camden & Amboy shops; I can't tell who the workmen were.

Cross 41. Was it the workmen that were under M'r Lockwood, as the superintendent of the car-shops, that done the work?

A. I cannot say that it was. I never done any of it myself, and I don't recollect of ever seeing it done.

Cross 42. How many cars were the Stevens brakes put on on that road?

A. I recollect that there were two cars with that brake on.

Cross 43. How long were they continued on those cars?

A. I cannet say.

Cross 44. Were they finally taken off and brakes like Exhibit A put on?

A. Perhaps they have been.

Cross 45. How long since you last saw them on the cars?

A. I can't say how long.

Cross 46. About how long, as near as you can tell?

A. I have nothing to refer to at all.

Cross 47. Well, about how many years since you recollect seeing that brake on your cars?

A. I can't say; I can't give you any date.

415 Cross 48. How many of the Hodge brake were put on the cars on that road?

A. I cannot say how many they had on.

Cross 49. Well, about how many? Tell as near as you can.

A. I can't give you any number; I did not put them on, nor help put them on.

Cross 50. Were they put on in the shops where you were at work?

A. I don't recollect of ever seeing any put on.

Cross 51. Were not these Hodge brakes put on their cars (the Camden and Amboy cars) by the Camden & Amboy Company?

A. I can't say; I never heard anything said about it.

Cross 52. Was it before or after the Stevens brake was put on there, before the Hodge?

A. I think the Stevens brake was put on after the Hodge brake.

Cross 53. Do you think there was more of the Hodge brakes put on than the Stevens, or less?

A. There might, perhaps, have been more of the Hodge brake put on.

Cross 54. How long were they continued on the cars?

A. I am not able to say how long.

Cross 55. How long since you recollect seeing any of them on the cars?

A. Probably five years ago. It was on a car built at Trenton Car-Works, built for the West Jersey Company. We took the brake off and put on one like Exhibit A.

Cross 56. How long since you recollect of seeing the Hodge brakes that were first put on at the Camden and Amboy shops?

A. I can't say how long.

Cross 57. Have you been working at car repairs to the present time?

A. At new work and repairs.

Cross 58. How many times did you help repair the old Tyler car from 1843 to 1850?

A. I can't say.

Cross 59. Did you a number of times?

416 A. I can't say about that.

Cross 60. Can you say that you did not as many as six times between 1843 and 1850?

A. I cannot say.

Cross 61. During that period of time, did you often help repair cars that had on brakes like Exhibit A?

A. I have repaired cars after the latter part of 1844 with those brakes on; I can't say how many.

Cross 62. Is it not possible for you to be mistaken about seeing this brake like Exhibit A in the fall of 1844 first, and not at some future period, inasmuch as you say you had repaired cars with that brake on after that time?

A. According to the best of my knowledge and belief, it is not.

Cross 63. Do you mean to swear positively that that brake was on that car, John Tyler, when you first repaired it in the fall of 1844?

A. According to my best knowledge and belief, that brake was on that car before I undertook to repair that car.

Cross 64. Is it not possible for you be mistaken about that?

A. According to my knowledge and belief, I am not mistaken.

Cross 65. I asked you if it was not possible for you to be mistaken? (Objected to, for the reason that the question has been already answered.)

A. I believe I have answered the question over and over.

Cross 66. When was the brake like Exhibit A put on the crate-car you have spoken of? Was that on before you repaired the Tyler car, in the fall of 1844?

A. I can't say positively.

Cross 67. How many of those long crate-cars did the Camden & Amboy Company have in 1844?

A. I cannot say now.

417 Cross 68. Did they have quite a number of them, according to your best recollection, in 1843 and 1844?

A. They had not.

Cross 69. About when did they commence using those long crate-cars?

A. They might have had one or two of them from 1844 to 1847.

Cross 70. Did they not have any before 1844?

A. I cannot say whether they had or not.

Cross 71. Can you say positively that the Stevens and Hodge brakes, or either of them, were put on the cars of the Camden & Amboy road between 1850 and 1855?

A. I cannot.

Cross 72. Can you say they were put on between 1850 and 1857?

A. I cannot say when they were put on.

Cross 73. Did you hear the witnesses Lockwood, Thompson, Smith, and Cox testify in this case here last week?

A. I did.

Cross 74. Are you acquainted with all of them?

A. I am.

Cross 75. Have you often, within the last three months, heard them speak of this John Tyler car, and the brake that was put on it in 1843, and have you often talked with them about it?

A. Two of those witnesses I have never talked with about it, and never heard them express themselves in reference to it, until they testified; the other two I have not talked the matter over with to gain any information; I have not talked with them on the subject.

Cross 76. Did you come on to New York with them last week from Bordentown, and did you remain here with them from Wednesday until Friday afternoon, and did you then return with them to Bordentown?

A. I came on with the four on Wednesday morning, and returned with one on Friday afternoon; I remained on Wednesday with two of them in this city.

418 Cross 77. Did you often, after the fall of 1844, have occasion to unhook these double brakes when repairing cars with them on, in order to take out the trucks—I mean between 1844 and 1850?

A. I had with those cars which had the double brake on like Exhibit A.

Cross 78. Please mention the time when you repaired any car after the fall of 1844 with said double brakes on?

A. I can't specify any particular time now.

Cross 79. Can you recollect of doing so in either the winter, spring, summer, or fall of 1845?

A. I recollect we had one car in the shop during that time with the double brake on.

Cross 80. What car was that, and at what time; what season of the year?

A. It was the car John Tyler, but at what season of the year I can't say. I repaired cars a month ago, but I could not give the date; I can't remember.

Cross 81. Can you say positively whether it was in the spring or fall of 1845 when you repaired the Tyler car?

A. No, sir: I cannot.

Cross 82. Now, sir, did you repair the said Tyler car late in the fall of 1846?

A. I don't know that I worked on her at that time; I might and I might not.

Cross 83. Might it not have been possibly in the fall of 1846 that you worked on her instead of 1845?

A. I can't say about that.

Cross 84. How do you fix any of the dates you have given of seeing the brake like Exhibit A?

A. I was called out to help repair the car with a patent brake, or cross-lever brake, like Exhibit A, and, in order to get the truck out, I had to detach the rod which was connected with the cross-lever attached to the body of the car, and with an upright lever attached to the brake-bar of the truck. My attention was called to it the latter part of 1844.

Cross 85. Is that all the sure means you have of knowing that it was at that time and not at some subsequent period?

A. It is, to the best of my knowledge and belief.

419 Cross 86. At what time did the Camden & Amboy passenger trains first commence running through to Jersey City?

A. I don't know; I am unable to say.

Cross 87. How do you know that they did not run through in 1843?

A. Well, I never heard that they did or did not, and therefore cannot say anything about it.

Cross 88. Did you not say that they changed passengers at New Brunswick in 1843; that the cars did not run through to Jersey City at that time?

A. I did.

Cross 89. Why, then, did you say, in answer to question 87, that you never heard, and therefore knew nothing about the cars running through to Jersey City in 1843?

A. I never heard of our cars running through to Jersey City in 1843, and therefore I cannot say.

Cross 90. Then you do not know whether they did run through to Jersey City or stopped at New Brunswick in 1843, do you?

(Objected to, as the witness is not a dispatcher of trains nor keeper of the running of trains, but is a car-builder.)

A. I do not.

Cross 91. Was the said Stevens and Hodge brakes, or the cars that they were on, ever repaired in your shops at Camden and Amboy while those brakes were on them, to your knowledge?

A. I presume they have been repaired there while those brakes were on; if they haven't, it would be very strange. I have no recollection of them.

Cross 92. You speak, in one of your answers, of being called out to help repair a car with patent brake, or cross-lever brake. Did you understand at that time that this cross-lever brake was patented or that there was a patent on it?

420 A. I never heard anything about that until M'r Sayles called at our shop to see me, about a month or two ago. He was talking to me about this brake, which he told me was patented, and that there was some trouble about it. That was the first I ever heard about the brake being patented, and he put some questions to me, asking me if I didn't think there was a possibility of my being mistaken as to dates, &c. I told him I didn't think I was. He said there was a considerable amount of money at stake in this concern, in the brake affairs. I don't recollect what I said. He said he would like to have me weigh the matter, or think it over, and see if I am not mistaken. I don't think there was much more said about it, as M'r Sayles was not there but a few minutes.

Cross 93. At how early a date do you recollect of seeing this double brake, like Exhibit A, on the crate car you spoke of?

A. The first time I saw that brake on that crate-car was in 1847.

Cross 94. Can you say positively that you *see* it on that car before 1848?

A. I think I can, according to my best knowledge and belief.

Cross 95. What circumstance was there connected with it that makes you remember that it was in 1847 and not in 1848?

A. It was one of our first long crate-cars that had a brake attached to it like Model Exhibit A.

Cross 96. Did you not say, in answer to the last question, it was the first long crate-car that had the patent brake on, when M'r Whipple, defendant's attorney, said the cross-lever brake, and then did you not change your answer?

A. I said it had a patent brake, or cross-lever. I was thinking about the conversation with Mr. Sayles at our shop when I first heard of its being a patent brake.

Cross 97. Now, sir, can you swear that it was not in 1845 or 1846 that you first saw said double brake like Exhibit A on that long crate-car?

A. I won't swear anything about that it was not in those years, but think it was in 1847.

421 Cross 98. When was your attention first called to this car John Tyler, or the brake that was on it in connection with this suit, and by whom?

A. I don't exactly recollect the time; probably three months ago, perhaps not so long—not over two months. M'r Edwin Lockwood asked me if I recollected the car, and the springs connected with it, brakes, side motions. I told him that I had a recollection of the car—I had worked on it several times in its day; but I don't know what words we exchanged about it particularly. He said there was some trouble about the cross-lever brake we were using, but he didn't say that it was a patent brake or anything of the kind, nor I didn't ask him.

Cross 99. Did you ever see M'r Whipple, the defendant's attorney, here before you saw M'r Sayles, a month or two ago? If so, where and when?

A. I saw the gentleman at Bordentown; I can't give date; it was over two months ago.

Cross 100. How much over two months ago, as near as you can recollect?

A. I have nothing to refer to, and therefore I can't tell.

Cross 101. Was it as much as three months ago, in your opinion?

A. It don't seem to be that long.

Cross 102. Was it four months ago when you first saw him?

A. I can't say.

Cross 103. Can you say that it was not five months ago?

A. It was not five months ago, I think, according to my best knowledge and belief.

Cross 104. Did you at that time, when you first saw him, give M'r Whipple a statement in writing as to what you knew of this car John Tyler and the brake that was on it?

A. I did.

Cross 105. What did you say in that statement which you gave Whipple that you knew of the John Tyler and the brake that was on it?

422 A. I gave him a statement that it was a cross-lever attached to the body of the car to an upright lever attached to the brake-bars of the truck, and that connecting the cross-lever with an upright lever to the brake-bar of the truck with a long rod running to the cross-lever,

and attached to the centre of the body, and then attached to an upright shaft, as you find represented in Exhibit A.

Cross 106. Did you state to him at that time, the time when you first saw this car, the John Tyler, that is, in the statement you gave Whipple?

A. The first time I don't think I did.

Cross 107. Have you given him more than one statement in writing in reference to it?

A. I have no knowledge of doing so.

Cross 108. Did you not say in that statement in writing that the back action or double brake had been in use on the Camden and Amboy road, or on the car John Tyler and other cars, for a certain number of years; and, if so, how many years did you there state?

A. I don't recollect the number, but it was over twenty years. I hadn't thought anything about time. That was the reason I gave him the answer as I did.

Cross 109. Did M'r Whipple, the defendant's attorney, here, while the last question was being written down, make the remark, "over twenty years," before you answered the question?

A. Yes; I heard him here.

Cross 110. Did not M'r Whipple tell you about the time you gave him that statement that he would want you as a witness in this case?

A. I don't think he did.

Cross 111. Have you seen him since that time before you came on here as a witness last week?

A. I met him in the street in Bordentown, between six and seven o'clock, some weeks since, and he said he was in a hurry, he wanted to catch the train; I think I shook hands with him, and he left.

Cross 112. Did you hear him say about the time you gave him that statement anything about any patent being on that brake?

423 A. I did not hear him say anything about any patent until I heard M'r Sayles speak about it. That was my first knowledge of its being patented.

Cross 113. What did you understand that he wanted that statement from you for?

A. I understood from him that there would be a little trouble about the brake.

Cross 114. Did you not understand from him, or from some others about that time, that there was a suit pending about that brake?

A. I did not from M'r Whipple at the time. I think M'r Edwin Lockwood spoke about it some days afterwards.

Cross 115. Did you learn from M'r Lockwood, or anybody else about that time, that the Camden & Amboy Company had bought the right to use that brake?

A. I never had heard anything about that until M'r Sayles called down to see us, and he said that the Camden & Amboy Railroad Company had paid him for the use of the right of it. I asked M'r Edwin Lockwood how it was, and he said he didn't know anything about it, and then the subject was dropped.

Cross 116. Do you remember a brake being tried on the Camden and Amboy road called the McLoughlin brake?

(Objected to for the reason that the subject-matter has nothing to do with the matter involved in this controversy.)

A. I do.

Cross 117. Please describe the construction of that brake.

A. The McLoughlin brake had a bar extending from the under side of the car-body from centre to centre, with a yoke attached, and two arms extending out at each end of the car, connecting with a cross-lever, so that when the cars come together it would act on the brakes through the centre lever.

Cross 118. When was this McLoughlin brake put on the cars?

424 A. Perhaps fourteen years ago; I can't exactly tell.

Cross 119. How long did they remain in use on the road?

A. Perhaps there might have some of them remained on eight or nine years; I know they kept throwing them off along.

Cross 120. Did the cars belonging to the New Jersey Railroad & Transportation Company often come to your shop for repairs between 1843 and 1852?

A. No, sir.

Cross 121. Did they occasionally?

A. I can't say that they did.

Cross 122. Did you see this double brake, like Exhibit A, on any of their cars before 1851?

A. I can't say that I ever did; I did not very often see them to know.

WILLIAM VENABLE.

Subscribed and sworn to before me this 6th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

CHARLES YUNDT, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Charles Yundt; 51 years of age; reside at the city of Camden, New Jersey; and at present am in a restaurant—was formerly a locomotive engineer.

Q. 2. In the employ of what railroad company?

A. The Camden & Amboy.

Q. 3. When did you commence as locomotive engineer on that road, and for how many years were you so employed?

425 A. In 1840, on the 19th day of April, and left in 1856, making 16 years.

Q. 4. Do you recollect the company running excursion-trains? If so in what year did they run such trains?

A. In 1843, 1845, and 1846. I run them myself as engineer.

Q. 5. Do you know anything about the use on the cars of that road of double brakes? If so, when was your attention first called to such brakes? State the circumstances attending such knowledge.

A. To the best of my knowledge, it was in 1845; I had a car on that had a double brake on, and it gave out, and I had to put another bolt in, and put the rod up to its place; the rod was connected at one end to a cross-lever.

Q. 6. Where did you get your bolt?

A. I got it out of my tool-box on my engine.

Q. 7. Did the falling down of this rod make any noise on the track?

A. Yes, sir; they rung the bell, and I stopped; when I stopped the passengers jumped out of the car, and thought it was off the track; they thought something was wrong.

Q. 8. (Witness is here shown Model Exhibit A, and asked) if it was a brake like the one seen in said exhibit; if so, he is asked to point out the rod which fell down upon the track, and which he put up again by the aforesaid bolt which he got from his engine.

A. It was a brake like the exhibit; the bolt came out of the rod attached to the end of the cross-lever; the rod was dragging the same way I was going.

Q. 9. Supposing it had been the rod connecting with the other end of the cross-lever, what would have been the effect?

A. It would have bent the rod all up.

Q. 10. How do you fix the date of these excursion trains, run at the time of this occurrence of the falling down of the brake-rod?

A. I cannot do that.

Q. 11. Do you know that it was in the year 1845 that these excursion trains were run, and that this thing, or circumstance of the rod falling down took place?

426 (Objected to because he has answered it.)

A. I do know that these excursion-trains were run in 1845, and that this circumstance must have been in July or August.

Q. 12. Was this double brake, at this time, on any other car or cars of that road beside on the one in which the brake-rod fell down, and which you put up, as you have stated?

A. I don't remember but the one.

Q. 13. Do you know of such brake being used on the cars of that road after this time?

A. Yes, sir.

Q. 14. Are such brakes now in general use on the cars of that road?

A. I believe they are to the best of my knowledge.

Q. 15. Were they in general use when you left the road, in 1856?

A. Yes, sir.

Adjourned to 10 a. m., the 7th inst.

WEDNESDAY, *August* 7, 1867.

Present, counsel for the respective parties, as before.

Q. 16. How do you fix the date of running the excursion-trains alluded to in a previous question, in the year 1845?

A. I was married in 1844, and I did not run any during that year; and in 1845 and 1846, I run them.

Q. 17. Do you know of a special train passing over the Camden & Amboy Railroad with President Tyler on board? If so, what do you know about it?

A. I run it myself, about the middle of June, to the best of my knowledge; it was in the year of 1843.

427 Q. 18. From what place did you take such special train? Where did you take the President on board, and where did you leave him?

A. From Camden, New Jersey, where President Tyler came on board, and we left him at Princeton, New Jersey.

Q. 19. Did you afterwards take the President in said special train from Princeton to any other place? If so, to what place?

A. We did; we took him to New Brunswick.

Q. 20. From New Brunswick to what place did the President go, and how was he conveyed?

A. He went by carriages from New Brunswick to Perth Amboy.

Q. 21. How did he get from Perth Amboy to New York—by what conveyance?

A. By steamboat.

Q. 22. Do you know anything about a car used on the Camden & Amboy Railroad called John Tyler?

A. I do.

Q. 23. Had said John Tyler car a double brake on it like the one on the car on which the brake-rod fell down in said excursion-train of 1845?

A. Well, I can't say that; the Tyler car had a brake on like the one that the rod fell down had on; there were two cars in the train that had that brake on, but I can't tell which one it was that the rod fell down on.

Q. 24. Who was conductor of said excursion-train, and who was brakeman?

A. I can't tell exactly who the conductor was; sometimes we had one, and sometimes another; William Crim was a brakeman on that train at the time when the rod fell; from the best of my knowledge, I believe he was.

Q. 25. Is the person sitting at the left of the commissioner William Crim?

A. It is.

Cross-examined by M'r Sayles in person:

Cross 26. Where were those excursion-trains run to?

428 A. Run from Philadelphia to South Amboy, then they took the steamboat and came to New York, and then back to Amboy, where they took the cars and went to Bordentown, and the steamboat took them from there to Philadelphia, the whole excursion being made on the same day.

Cross 27. Were those excursion trains run after 1845; if so, how long?

A. I run them in 1846.

Cross 28. Were they run after 1846?

A. To the best of my knowledge, that was the last year they run them.

Cross 29. Did you run as engineer on the road after 1846?

A. I did, until 1856.

Cross 30. What portion of the road did you run on after 1846?

A. I run between Camden and South Amboy, and between Camden and New Brunswick, and between Tacony and New Brunswick.

Cross 31. Did you ever have any brake-rods fall down in your train, except on the occasion you have mentioned?

A. Not that I remember.

Cross 32. And how many years did you run as engineer when brakes like Exhibit A were on your cars?

A. I run from 1845 to 1856.

Cross 33. How long was your train detained in consequence of that rod falling down?

A. Just long enough to put the bolt in.

Cross 34. About how many minutes should you judge?

A. I could not tell.

Cross 35. About how long? Tell as near as you can.

A. About ten or twelve minutes, I should suppose.

Cross 36. Was it a common occurrence for your train to be detained a short time in consequence of some of the machinery of the train being out of order during every year while you were engineer?

A. Not very often; very seldom.

Cross 37. Was it occasionally the case?

A. I told you it was.

429 Cross 38. In what respect were the running of these excursion-trains, so far as you as engineer was concerned, different from the trains run after 1846 between Camden and South Amboy?

A. There were no more run, to the best of my knowledge, after 1846.

Cross 39. What time did your excursion-trains leave Camden?

A. I think quarter past six o'clock; they left Philadelphia precisely at six.

Cross 40. After 1846, was there a train left Philadelphia about the same time in the morning for South Amboy?

A. There was one left at seven o'clock that run to South Amboy with New York passengers; there was no six o'clock train in 1847, but there was a passenger and freight train somewhere in 1848 and 1849; I could not say positively; I run the seven o'clock train in 1847.

Cross 41. In what respect was this seven o'clock train, in 1847, different from the excursion train you have spoken of, so far as the engineer of the train is concerned?

A. It is a through train for passengers from Philadelphia to New York.

Cross 42. Did each of those trains run from Camden to South Amboy?

A. The seven o'clock train did; the excursion sometimes run from Camden to Amboy, and sometimes the steamboat took them from Philadelphia to Bordentown.

Cross 43. Were your duties as engineer very different on the excursion-trains in 1845 and 1846 from what they were on the seven o'clock train in 1847?

A. There was no difference; it was the same.

Cross 44. Whereabouts on the road was that train when this break-rod fell down on the track?

A. Two or three miles beyond the station of Hidestown.

Cross 45. How many cars were there on that train at the time?

A. I could not tell at that time; sometimes we had eight, and sometimes as high as fifteen passenger-cars.

Cross 46. Did the most of the passenger-cars at this time have brakes on like Exhibit A?

430 A. I don't remember that; but I know the brake was on this car at the time when the rod fell down.

Cross 47. How many passenger-trains were run on that line to South Amboy a day, in 1845?

A. There were two through passenger-trains.

Cross 48. Were there any other trains on that route with passenger-cars connected with them at that time?

A. Yes, sir; there was freight-trains with emigrant-cars attached to them, and there was one passenger-car to pick up way-passengers along the road; there was one each way a day, separate trains.

Cross 49. You say the excursion-train at this time made the round trip each day, did you not?

A. No, sir.

Cross 50. What did you say in regard to that?

A. We made excursions once or twice a week; the excursion was called the New York day excursion; there and back the same days.

Cross 51. Did the same train of cars which took the passengers to South Amboy take the passengers back from South Amboy the same day to Bordentown or Camden?

A. Yes, sir.

Cross 52. Now, did the other passenger train you speak of being run on the same day, run from Camden to South Amboy and back to Camden the same day?

A. They had their own train, two separate trains, they same as they now have.

Cross 53. Then do I understand that it required three separate trains of cars to run the two trains—the excursion-train and the other passenger-train you speak of as being run the same day as the excursion-train was run, in 1845?

A. There were three separate trains of cars.

Cross 54. Were not these emigrant-cars you speak of called passenger-cars?

A. No, sir, not while I was there; they were always called emigrant-cars; they were not finished like the regular passenger-cars; the seats were not cushioned, but they had windows in the sides, and slide-doors; they were long cars; some of them had six-wheel trucks, and some four-wheel trucks.

431 Cross 55. About how many of these emigrant-cars had that company in 1845?

A. I don't know; they sometimes had as many as four or five on a train, especially from New York; there were two trains, and they were attached to the freight-line.

Cross 56. You say on the excursion-train in 1845 you sometimes had eight cars, and sometimes fifteen in the train; about how many passenger-cars were run on each of the other two passenger-trains that run the same day you run the excursion-trains?

A. From three to five, as near as I can remember.

Cross 57. Did each of those three trains you speak of have these long crate-cars attached to them in 1845?

A. Yes, sir; on the route between Camden and Amboy.

Cross 58. What other passenger-trains at that time, in 1845, did the Camden & Amboy Company run, and on what route?

A. They run on the Philadelphia and Trenton road to New Brunswick; there was one mail-train run each way; there were two separate trains of cars run from Tacony and Bristol to Jersey City; one train belonged to the Camden & Amboy Company, and one to the New Jersey Railroad and Transportation Company.

Cross 59. Did they not run two trains each way from Philadelphia to New York, by the way of New Brunswick, in 1845?

A. I don't remember.

Cross 60. How many passenger-cars were attached to those two trains you speak of, running to Jersey City?

A. There were three to five to each of them, and a long crate-car attached to each of them also.

Cross 61. Did the Camden & Amboy Company at this time, in 1845, have a number of surplus passenger-cars—I mean more cars than they run regularly at that time?

A. Yes; for excursion days they had to go all around and get them.

Cross 62. During this time, in 1845, you say the excursion-trains run to New York once or twice a week; at what time did the trains
432 leave Philadelphia in the morning at that time on the days between the running of the excursion-trains?

A. I think at seven o'clock.

Cross 63. What cars do you recollect of seeing this brake like Exhibit A on, during the first year you saw them?

A. I never saw them till 1845, that I remember; I can't tell which car it was on; I don't know whether it was on the Tyler car or the Amboy; I know it was on one of the train.

Cross 64. When did you first see the Tyler car?

A. In the spring of 1842 or 1843, I went after it—went after it from the Trenton road, to put it on the Amboy road; and after the car was finished, I took John Tyler through on the same car, and that is the way she came to be named John Tyler.

Cross 65. Is it not possible for that brake-rod to have fallen down in 1846 instead of 1845?

A. I suppose it might have done so, but it didn't with me.

Cross 66. Why are you so positive that that occurred in 1845, and not at some other time?

A. I have told you that I was married in 1844, and I took the excursion-trains in 1845, and it was in that year that the rod fell down.

Cross 67. That, then, is all the reason you have, is it?

A. That is all; I got my clothes all dirty going under the car, and my wife asked me what was the matter with me when I got home, and I told her what was the matter with me, that I had to go under the car; at that time they didn't carry any tools in the baggage-car, as they do now, and if anything happened to the passenger-cars along the road, the conductor always came to the engineer first to fix them; and if it couldn't be fixed, we had to leave the car on the switch or siding.

Cross 68. Did you ever have occasion to go under a car at any other time to repair it in any other way?

A. Yes, often; previous to that time, and also after.

Cross 69. Did you ever get your clothes dirty in going under the cars at any other time?

433 A. Yes, sir; every time; I couldn't help it.

Cross 70. Did you often tell your wife that you got your clothes dirty by going under the cars?

A. Not so very often; I did when something happened; a breakdown or something of that kind.

Cross 71. Was this double brake on the crate-cars which run in your train in 1845 and 1846?

A. Not as I remember.

Cross 72. Did the Tyler car generally run in your trains at that time?

A. Yes; it did sometimes run on excursions.

(At this point in the case, S. B. Cozzens appears in the case on behalf of M'r Sayles.)

Cross 73. When did they first begin to carry the tools in the baggage-cars?

A. I think it was somewhere along in 1846; they carried chains, connections, links, bolts, jack-screws, crowbars; the small tools were carried on the engines.

Cross 74. Fix this time more nearly, if you can.

A. Somewhere along there; I think it was the last year on our excursions I got the jack-screws, which was in 1846.

Cross 75. On how many cars do you recollect having seen this brake like Exhibit A, in the years 1846, 1847, 1848, 1849, and 1850?

A. I don't know; I never counted them.

Cross 76. State as near as you can.

A. I can't come anywhere near it; I don't remember.

Cross 77. Were there as many as a half dozen?

A. I should think so.

Cross 78. Were there as many as twenty?

A. I don't know.

Cross 79. To the best of your recollection, were there as many as 20?

A. I never counted them; I could not tell.

Cross 80. Is there any one of the years named in which,
434 to the best of your recollection, there was as many as twenty?

A. I don't remember anything about it.

Cross 81. Do you know about how many cars the trains you ran in the year' 1846, '47, '48, '49 averaged?

A. No, I don't; sometimes they run four or five, sometimes a dozen, and sometimes as many as fifteen.

Cross. 82. Can't you tell about how many of these cars were fitted with brakes like Exhibit A?

A. I cannot; we had a good many different kinds of brakes on what I run, and others, three different kinds; I do not know anything about how many of those cars had on brakes like Exhibit A.

Cross 83. Do you know whether cars which had on brakes like Exhibit A ran pretty often to South Amboy in the years 1845, '46, '47, '48, or '49?

A. Yes; most every day except Sundays.

Cross 84. Did either or both of the two cars of which you have spoken in your direct examination as being provided with brakes like Exhibit A run pretty often to South Amboy in the years just mentioned?

A. The first one I saw myself was in the year 1845; and I run it during the excursions in the summer myself; I run one or two a week; yes, those cars did run pretty often to South Amboy in the years mentioned, 1846 and 1847.

Cross 85. Was there a car on the Camden & Amboy road named the Amboy?

A. I don't remember.

Cross 86. When, recently, was attention first called to this brake like Exhibit A?

A. About a month ago.

Cross 87. Who spoke to you about it then?

A. Thomas Herbert, I think it was.

Cross 88. Did you about that time or since have any conversation with M'r Lockwood about it?

435 A. Yes, sir; M'r Lockwood came to see me, and he asked me if I remembered anything about the brake, and I told him I did.

CHARLES YUNDT.

Subscribed and sworn to before me this 7th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

WILLIAM CRIM, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. William Crim; 55 years of age; reside at Camden, New Jersey, and am engaged in the repair-shop of the Camden & Atlantic Railroad Company.

Q. 2. Were you ever in the employ of the Camden & Amboy Railroad Company?

A. Yes, sir.

Q. 3. From what time to what time, and how were you so employed?

A. From 1833 to 1850; I was most part of my time brakeman.

Q. 4. Do you know Charles Yundt; and, if so, did he run excursion-trains on that road, and were you his brakeman at any time when such trains were run?

A. I do know him, and I was his brakeman during 1845 and 1846.

Q. 5. Do you know of the use of double brakes on any car or cars on that road during the years 1845 and 1846; if so, what circumstance, if any, called your attention to the fact of such use?

A. I do know of a double brake, one or two during that time;
436 there was one of the rods of the double brake fell on one of the excursions, and the train was stopped, of course, and M'r Yundt, the engineer, put a bolt through the lever of the brake-rod.

Q. 6. (Witness is now shown Model Exhibit A, and is asked) if the brake on that model is like the one on the car on which the rod got loose from the centre lever attached to the body of the car, and fell to the track?

A. Yes, sir.

Q. 7. Please point out the rod connected with the centre lever that became detached from it, and fell to the track.

A. It was the rod as the car was going ahead which fell and dragged upon the ground; it made a great rattle and a great deal of dust.

Q. 8. To what part of this centre lever was the rod which fell attached; to the end of the lever, or between the end and centre?

A. I can't exactly say whether it was the middle one or out end ene.

Q. 9. Was it the rod extending towards the engine or from the engine?

A. From the engine.

Q. 10. Do you know anything about the use of a car on that road called the John Tyler? If so, what was there peculiar about it which makes you remember the case?

A. The car was called John Tyler, and it had different seats from what cars have nowadays; they worked on a pivot; some were round, some armed chairs, and different shapes.

Q. 11. Do you know of your own personal knowledge that there was in use upon said John Tyler car, in the year 1845 or 1846, a double-acting brake like the one here on model Exhibit A?

A. Yes, sir.

Cross-examined by M'r Cozzens, counsel for complainant:

Cross 12. Was the brake like Exhibit A the first double-
437 acting brake of any kind which was used on the Camden and Amboy road?

A. The first that I knew of.

Cross 13. Do you think you knew when double-acting brakes came to be used first upon that road?

A. I think I do.

Cross 14. In the years 1845, 1846, 1847, and 1848 how many cars on the Camden and Amboy road were fitted with brakes like Exhibit A? State to the best of your recollection.

A. That I cannot say; I should think there were a couple of dozen, to the best of my knowledge.

Cross 15. Did some of these cars in those years run pretty often to South Amboy?

A. They did.

Cross 16. Do you know whether any of those were ever repaired there?

A. Not to my recollection.

Cross 17. Did any of these cars fitted with brake like Exhibit A run to Jersey City during the years above mentioned?

A. Indeed I can't say.

Cross 18. Did they run on the through-mail trains?

A. I don't know.

Cross 19. Who first spoke to you about what you would be wanted to testify in this suit?

A. Richard C. Walcott, a witness now present.

Cross 20. Has M'r Edwin Lockwood had any conversation with you about it?

A. No, sir.

Cross 21. Who has conversed with you about it except M'r Walcott?

A. No one.

Cross 22. In the years 1845 and 1846, how many cars were there on the Camden and Amboy road fitted with brakes like Exhibit A?

A. I could not pretend to say how many.

Cross 33. Can you swear positively there was more than one?

A. There were two that I know of.

438 Cross 24. Was there any particular names for these two cars; if so, what names?

A. None, except the Tyler car; the other one never had any name or number that I know of.

Cross 25. Didn't this Tyler car run to Jersey City?

A. I cannot tell you whether she did or not.

Cross 26. Were you in the habit of paying particular attention to the construction of the brakes on those two cars you have mentioned?

A. No more than in the time of braking.

Cross 27. Did you ever know of the brake-rods falling down at any other time than the time mentioned in your direct examination?

A. I never did.

Direct resumed:

Q. 28. After it was found that the rods were liable to fall down, did they put up leather straps or links to prevent their falling in case they should break?

(Objected to.)

A. I think they put up links, staples or straps; iron straps in 1845, I think.

Q. 29. You say you do know when double brakes were first used on the Camden and Amboy Railroad; have you any knowledge of the use of such brake before 1845?

A. The first I knew of the brake was in 1845, I think; I don't know whether I knew of it before or not.

Cross 30. Then can you say you know that it was not used before 1845?

A. I can't say.

Q. 31. Do you know anything of a double-acting brake on that road before 1845?

A. I do not before 1845.

Q. 32. Do you wish to be understood that you do not know when it was first used?

439 A. The first of my knowing when it was used was in 1845; it might have been used years before that for all I know.

WILLIAM CRIM.

Subscribed and sworn to before me this 7th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to 11 a. m., the 8th instant.

THURSDAY, *August* 8, 1867.

Present, counsel for the respective parties, as before.

RICHARD C. WALCOTT, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Richard C. Walcott; 54 years of age; reside in Hoboken, New Jersey, and am a locomotive engineer.

Q. 2. Are you employed as such now, and by whom?

A. I am employed by the Land Improvement Association, at Hoboken.

Q. 3. Have you ever been employed as engineer of the Camden & Amboy Company; if so, from what year to what year were you so employed?

A. I commenced running a locomotive for them on the 13th day of December, 1835, and continued with them as engineer for twenty years.

Q. 4. What train were you employed to run in the early part of the year 1848?

440 A. I was sent to run the train from Trenton to Philadelphia, on the Pennsylvania side.

Q. 5. What event or circumstance enables you to determine the time when you commenced running this train?

A. The engineer who formerly run the train was killed February 25, 1848; I took his place the next morning, the 26th.

Q. 6. How do you fix the date of the 26th. as the day when you took his place?

A. I went down to Trenton and took the date of his death from his tombstone, which was February 25, 1848, and his name was Joseph Cox.

Q. 7. Do you remember about the time of taking his train of the use of a double-acting car-brake on that line; if so, what circumstance do you now call to mind that fixes the fact in your recollection?

A. Yes, sir; I do; we had a crate-car which run from Philadelphia to Trenton and back, which I run on that line back and forth every day. In going from Tacony to Trenton, we had no specified time in going, but in going from Trenton to Tacony, the steamboat left Bordentown one hour ahead of us; I had to go and make all the stops, twenty-five stops, and meet the boat at Tacony, and she took the passengers to Philadelphia. In going up to Trenton, we could stop just where we pleased, and in going down we had to hurry up and stop quicker; because, if we didn't get there ahead of the boat, the boat would have to wait for us; and M'r Van Rensselaer (the superintendent of the road) said if I didn't beat the boat, or get down in time for the boat, he would have to put some one there who would do it. In going down, and stopping at a place, we would go by; and I commenced talking pretty harsh to the brakeman about not putting the brake on. He said he put the brake on as hard as he could, but it would not hold. I told him to tell Abraham Claypole to leather the brake-blocks, and he told Abraham to leather the brake, and he told the brakeman that it did not want any on it. After I got out of the shop with the engine to drill the cars ready to start back, I saw Abraham, and I asked him if he had
441 leathered that brake; he said no; I said, "Why didn't you leather
it?" and he said it didn't want leathering; I told him it did, because we couldn't stop in the morning going down; and he said the brake was good, and says to me, "Get up on the crate-car and I will put the brake on;" I got up and screwed the lever up, and the chain caught in here (pointing to model Exhibit A), overlapped on the windlass-staff, and caught fast in the apparatus or stirrup in which the windlass staff is suspended, and it would not apply the brake; he took three or four links out of the chain by which it was shortened, and it held.

Q. 8. Do you wish to be understood that the reason why the brake would not hold on said crate car when the train was going down to

Tacony was that the chain attached to the brake-rod and winds around the windlass-staff caught the stirrups connected therewith, and hence the power of the brakeman could not be transmitted to the brakes, and that taking out three or more links of the chain this difficulty was obviated, and the brake thereafter held just as well in going to Tacony as when coming back from Tacony to Trenton, on the other end of the car?

A. After that it held just as well in going one way as the other.

Q. 9. Is Exhibit A a correct representation of the brake as then applied to the said crate-car in question?

A. Yes, sir.

Q. 10. Do you know of the use a car on that road called the John Tyler, before you took the train of M'r Cox, to run in 1848; if so, what kind of a brake was there on it?

A. It was a double brake, with a brakeman at each end; the same as Exhibit A.

Q. 11. Did this brake apply the power of the brakeman to both trucks at either end of the car?

(Objected to.)

A. Yes, sir; it did.

442 Cross-examined by M'r Cozzens:

Cross 12. How long did you run this train from Trenton to Philadelphia?

A. Five years.

Cross 13. Do you know of any cars on the Camden & Amboy road, between 1848 and 1850, which had such brakes as Exhibit A, beside the two cars you have mentioned?

A. Yes, sir.

Cross 14. How many such cars were there during this period?

A. I am pretty positive it was on the crate-cars on the mail-trains running to Jersey City and to South Amboy; it runs very strongly in my mind that it was on the ladies' car No. 12, running on the mail-train to Jersey City. I think it was on this car.

Cross 15. Didn't these crate-cars run regularly to Jersey City and Amboy, and didn't the ladies' car run regularly to Jersey City?

A. The crate-car and ladies' car run regularly every day to Jersey City; the other crate car was on the Amboy line on the other side of the river, and ran regularly in that line every day, except Sundays, to South Amboy.

Cross 16. About how long a period did these cars run in this way?

A. I don't know. I run one of the crate-cars five years, and the others I don't know about, because they were put on other trains.

Cross 17. Did the crate-car you run, run to Jersey City, or, if not, where did it run to?

A. The crate-car run between Tacony and Trenton.

Cross 18. I understood you just now to say that one of the two crate-cars you have been speaking about run regularly to Jersey City; was this crate-car the one which you ran or not?

A. No, sir; the one I ran I had every day.

443 Cross 19. Then you mean that the crate-car you ran ran only from Taconey to Trenton, and that the crate-car or crate-cars which ran to Jersey City were on trains with which you had nothing to do?

A. Yes; I had nothing to do with the other trains; the other locomotive got out of repairs, and I run them for a day or two.

Cross 20. Now, aside from the cars on these trains spoken of by you,

how many cars fitted with brakes like Exhibit A were there, to the best of your recollection, on the Camden and Amboy road between 1848 and 1850?

A. Well, I think to the best of my knowledge there were five different cars altogether, two besides the three I have spoken of.

Cross 21. What trains did those other two cars run in between 1848 and 1850?

A. One run on the mail-line from Philadelphia to Jersey City, and the other from Camden to Amboy.

Cross 22. Had those cars, or either of them, any name or number by which they could be designated?

A. These last two cars did not have any name or number that I remember.

Cross 23. Have you any other way of fixing the time when you took Cox's train than the date on the tombstone?

A. Yes, sir; M'r Fish told me to go down to Bordentown and tell Capt. Shipman (then superintendent of the road) that Joe Cox was killed, and send an engineer up; he said to me, "Wilkie, I don't know who to send, without I send you;" he then said, "Who will run your engine?" and I said my fireman could do that for a day or two; he then told me to go and run till further orders. I run for five years.

Cross 24. How does this enable you to fix February 26, 1848, as the time you commenced running this train?

A. How do I know I was born? I don't understand the question.

Cross 25. Between 1848 and 1853, which make the five years you have spoken of, did you know of any other kind of double brake, except that shown in Exhibit A, to be used on the cars of the Camden and Amboy road?

A. No, sir.

444 Cross 26. Did you, during any of these five years, see any double brake on cars on that road which had two cross-levers under the cars?

A. It appears to me I did see a brake of that kind on one of the cars. I don't know whether it was on the Camden and Amboy road; it might have been some other road, and I can't remember when it was.

Cross 27. What was the name of the brakeman on the train you ran, as you have stated, which run from Taconey to Trenton?

A. There were three or four different ones. Edward Doherty was on the line when I first went on. I don't know whether he is living. Joseph Davis was the next; he went out to Owego, or somewhere out that way. I don't know whether he is living or not. I think James Leeds took it next. I think he is living in Trenton. William Provost took it next; he is living and running a locomotive on the Jersey City road, from New Brunswick to Jersey City.

RICHARD C. WALCOTT.

Subscribed and sworn to before me this 8th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

JOHN H. JOBES, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. John H. Jobes; 63 years of age; reside in Jersey City, and have charge of the oils of the New Jersey Railroad & Transportation Company.

Q. 2. How long have you been in the employ of this company, and how were you employed before taking charge of the oils of said company?

445 A. I have been in their employ 32 years; the most of that time has been as a brakeman.

Q. 3. Do you remember that during this time, to wit, between the years 1843 and 1849, of a double-truck car belonging to the Camden & Amboy Railroad Company, coming to Jersey City with a double brake on it?

A. I do.

Q. 4. Please describe the circumstance that called your attention to said brake, and then describe the same.

A. The first that called my attention was, they said a car had arrived there with a double-acting brake on it; the reason why I took more notice of the brake was I was a brakeman and had a great deal of brakeing to do. I was very anxious to get them to put on the car that I was b'akeing on at the time; the brake, if my recollection serves me right, is what they call a double-acting centre-lever brake. If I had not seen the brake from the time I first saw it until the present time I should have known the brake by the drawing.

(The witness is here shown the Model Exhibit A, and is asked)—

Q. 5. If the brake on it is like the one which you saw on the car which you say came from the Amboy road, over the line of your road, to Jersey City between the years 1843 and 1849?

A. It is the same as near as can be drawn.

Q. 6. Did you examine the brake on the car when you saw it; if so, in what way, and what were the circumstances connected with such examination?

A. I got under the car to see this brake. I had never seen one of the kind, or one work before, and I was very anxious to see the movement of the brake.

JOHN H. JOBES.

Subscribed and sworn to before me this 8th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

446 THOMAS HERBERT, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Thomas Herbert; 47 years of age; reside at Camden, New Jersey, and am an inspector of cars for the Camden & Amboy Railroad Company.

Q. 2. How long have you been in the employ of that company, and when did you begin?

A. I hired with M'r Lockwood (the superintendent of the car department of that road) in 1844, in April, I think, and begun with him at the time, and continued in their employ up to the present time, with the exception of three years I was in the United States service, from 1863 to latter part of 1865.

Q. 3. In what years were you employed by the Camden & Amboy Company, in which you worked at Bordentown?

A. In 1844, 1845, 1846, and in July, 1847. I was sent to Camden.

Q. 4. Do you know anything about double acting car-brakes, in use on that road, during the years 1844, 1845, and 1846; if so, what do you know? Please state of your own knowledge.

A. Passenger cars came in there to be repaired; sometimes they

would be single brakes and sometimes double brakes. I couldn't hardly tell the number of the cars. In 1846, I think, the Tyler car came on there, and me and my father put a pair of wheels under her. In the latter part of 1846, M'r Lockwood took me from repairing to go in the shop with Charley Vandergriff, and he wanted me to stay with Charley and help him. I went to Charley, and I told him the boss sent me there to help him fix the trucks, and run them under, and let this passenger-car down on these trucks. The brake was a double brake which we put on the car; it had a cross-lever in the centre of the car; connected with this lever were four rods; one lever or rod on the right running to a post at the end of the car, on the platform; another one connected
447 with that about four inches back from the rod; on the opposite side of the lever there were rods connected, which ran to the post on the other platform, at the other end of the car.

Q. 5. (Witness is here shown Exhibit A, and asked) if the brake on this model is such a one as you have just described?

A. Yes, sir; that is the same kind of a brake.

Q. 6. You say that you and your father had occasion to put a pair of wheels under the Tyler car. Was there on this car, at that time, a brake like Exhibit A?

A. There was.

Q. 7. After you went to Camden, in 1847, as inspector of cars, and repairer of the same, did you know of the use of such brakes on cars of that road, as they came to Camden?

A. Yes, sir; there was one on a crate-car, and, I think, one on a passenger-car.

Q. 8. At how early a date did this double brake come into general use on that road on passenger-cars?

A. In 1848. The whole train had them on; a train of five cars, I think. To my knowledge, the five cars had them on.

Q. 9. Have nearly or quite all of the passenger-cars which come to Camden at the present time the double brake on?

A. Nearly all of them.

Cross-examined by M'r Sayles:

Cross 10. When was your attention first called to this double brake recently, and by whom?

A. I am not certain, but think that is the man (pointing to M'r Sayles) that was at my house. David Reynolds was with him. That was the first I knew concerning this brake about a suit.

Cross 11. How long have you been an inspector of cars at Camden?

448 A. From 1849 to 1863, when I went into the service, and resumed my place in 1865, and am so employed at the present time.

Cross 12. About how many cars did you and Vandergriff put this double brake on while you were at work with him?

A. I couldn't tell you, certain; some two or three, and perhaps there may have been more. We put them on all the new passenger-cars that were built in the shops while I was at work with him.

Cross 13. How long were you at work with him?

A. Some two years, I suppose.

Cross 14. It was also put on all of the old passenger and baggage cars when they were rebuilt or repaired during that time, were they not?

A. No, sir; they were not put on at the time they came in to be repaired or rebuilt. Some passenger cars came in to be repaired that had this brake on.

Cross 15. During the two years that you were with Vandergriff, was this double brake like Exhibit A put on the cars that run in the passenger-trains when they came in the shop for repairs or to be rebuilt; I mean those which hadn't this brake on previous to that?

A. I never put it on, nor help put it on, that I know of, on the old cars.

Cross 16. Did you work on the old cars at the time you were with Vandergriff?

A. Some days there would be five or six passenger-cars broke down; the boss would come to us and want us to go and help fix the cars, to send them out. Such a thing might happen one day and not again in three months.

Cross 17. Then you didn't work at repairing cars during this two years, only on extraordinary occasions, as you have just mentioned?

A. No, sir; I did not.

Cross 18. When you first went to Camden as inspector of cars, did most of the passenger and crate cars have this double brake on?

A. They hadn't all of them. Some had and some hadn't. The crate-
cars had them on, I know. There were more or less of the pas-
449 senger-cars on all the trains which run to Camden had them on.
Some had the single brake and some the double brake.

Cross 19. How many trains left Camden in a day at that time?

A. A train left at a quarter to six in the morning, and a train at twelve o'clock, and a way-line to Bordentown left at four in the afternoon. The twelve-o'clock line went to South Amboy and by steamboat to New York, and the quarter-past six went to Jersey City.

Cross 20. Did you ever see any other double-acting brake on the Camden and Amboy cars except the one like Exhibit A; and, if so, describe it?

A. Not to my knowledge. They might have been on, but they didn't come where I was.

Cross 21. You don't remember of ever having seen what was called the McLoughlin brake, do you?

A. I might have seen it, but have no recollection of it.

Cross 22. What were your particular duties as inspector of cars?

A. To feel all the boxes when they came in, to see whether they were cool or hot; and it was my place to examine the wheels, to see if they wore broken, and brakes, to see if they were in order, and everything underneath, to see that all was in running order.

Cross 23. Then, all the double brakes you recollect of having seen on the Camden and Amboy cars were arranged and applied like the brake shown on Exhibit A, were they?

A. Yes, sir.

Cross 24. Did I understand you to say in one of your answers that this double brake was put in general use on that road in 1848?

A. No, I think not.

Cross 25. Did you ever see a brake on any of the Camden and Amboy cars that had two cross-levers under the cars instead of one like Exhibit A?

A. Not to my knowledge. They might have been on. They didn't run where I had a chance to see them. They didn't come down where I was at Camden.

450 Cross 26. Has M'r Edwin Lockwood ever talked to you about this brake matter; if so, when?

A. He came down on the Amboy line from Brodentown to Camden, and jumped off the train, and told me that he wanted me to go to New York on a trial about a double brake, and that is all he said to me, and went aboard the boat. I didn't see him again until I saw him here yesterday.

Cross 27. Then he did not ask you what you knew about it, did he ?

A. No; I don't think he did; he was in a hurry.

Cross 28. Had you ever told anybody what you knew about it until you came to New York as a witness ?

A. George Vernon, the boss over the engines at Camden, he came to me on Monday last and told me to get ready to come to New York, by order of M'r Lockwood. I asked him what it was for, and he told me on account of this brake, and he asked me if I knew anything about it. I told him I did. He told me to get ready and come off the next morning by 5 o'clock train, by order of M'r Lockwood.

Cross 29. Who else have you talked with about this brake ?

A. There were several around the yard asked me if I knew anything about it; they knew I did.

Cross 30. How did they know you did.

A. I had been working at the cars so long they thought I ought to know something about the brakes.

Cross 31. Is that all the reason they had for knowing that you knew all about these brakes ?

A. That I couldn't answer.

Cross 32. Are they the only ones that have talked to you about the brake ?

A. They are the only ones, with Dan Reynolds. He spoke to me about it.

Cross 33. What did you say to Dan Reynolds about the brake ?

A. Dan asked me if I knew anything about the brake. I told him I did. He said if anybody knew I ought to know.

451 Cross 34. Is that all you said to him about it ?

A. I think that was all the conversation that passed between us about it.

Cross 35. Who was with Dan Reynolds at the time you had this talk about the brake ?

A. I think M'r Sayles, the complainant. It was night, near nine o'clock, when he came to my house.

Cross 36. Then you have not talked with M'r Whipple, defendants' attorney, about it since you have been in New York, have you ?

A. He asked me if I knew anything about this brake, and I told him I did. I never saw him before till I came here.

Cross 37. Did you not talk with M'r Lockwood about it yesterday ?

A. No, sir.

Cross 38. Have you not talked with the other witnesses in the case about it since you have been in New York ?

A. William Venable and me were talking about it.

Cross 39. Did you not say in one of your answers that those men in Camden were the only ones you had spoken to about it ?

A. You asked me if Lockwood hadn't been talking to me about it; I told you that he hadn't, that he wanted me to go to New York about a trial about the brakes; the only one in Camden I had spoken to about it, I meant.

Cross 40. Were there brakes on nearly all the cars that run in the passenger-trains that run to Camden in 1861 and 1852 ?

A. Some had them on and some hadn't; some had double brakes and some single brakes.

Cross 41. At how early a date did the majority of the cars running in the passenger-trains have these brakes on ?

A. In 1848 they had them on some of the cars on the passenger-trains that run from Camden to Amboy and from Camden to Jersey City.

452 Cross 42. You say in 1847, when you went to Camden, there was three trains left there a day. How long after that before there was a train left there in the evening for New York or after 12 o'clock noon?

A. I couldn't tell exactly, they altered the line so. I should think in 1850. I am not positive, any way.

Cross 43. Can you swear that they did not run a New York train from Camden after 12 o'clock in 1847?

A. I don't think I can swear about that. I don't think they did.

Cross 44. Did this train that you speak of in answer to the 8th direct interrogatory run from Camden to Amboy or to Jersey City?

A. That run to Jersey City regularly.

Direct resumed:

Q. 45. Do you wish to be understood that there was a trial run from Camden to Jersey City with five cars in it, all of them having double brakes on, in 1848?

A. I don't think I said they all had them on. I said there was five cars in the train, and I said some had them on and some did not.

Q. 46. Is that what you wish to be understood in your answer to the 8th direct interrogatory?

A. Yes, sir.

Cross resumed:

Cross 47. What was your answer to the 8th direct interrogatory, which was as follows: "At how early a date did this double brake come into general use in the passenger-cars of that road?" Did you not say in 1848 the whole train had them on, a train of five cars, I think, to my knowledge?

453 A. Well, I might have said five cars—that we run five cars. I couldn't say about brakes on all of them; they had on some, I know.

THOMAS HERBERT.

Subscribed and sworn to before me this 8th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to 11 a. m., the 9th inst.

FRIDAY, *August* 9, 1867.

Present, counsel as before.

BENJAMIN L. WALCOTT, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Benjamin L. Walcott; 45 years of age; reside at Bordentown, New Jersey, and am ticket-collector on the Camden & Amboy road.

Q. 2. When did you enter the employ of the Camden & Amboy company; what did you do first, and what have you done from that time to the present as the employee of said company?

A. I entered it in 1843, as brakeman. I was a brakeman until about the latter part of May or the first of June, 1845. I then went as fireman. I fired for a man by the name of Charles Yundt, who always went by the name of Dutch Charley. I was conductor after that, and then ticket-collector, which office I now hold.

454 Q. While you were fireman with Yundt, did the company run excursion-trains; if so, in what year, and what circumstance enables you to fix the date?

A. They did, in 1845. I was married on the 13th day of April, 1845. A few weeks after that I commenced firing, and fired for that man eleven months.

Q. 4. During the time that you were fireman for said Yundt, on said excursion-train, did you know of the use of a car in that train which had a double brake on it; if so, what was the name of said car, if it had any, and what circumstance is connected with your applying the brake to said car?

A. I did. The car went by the name of the John Tyler car. In going down the cut, two miles this side of South Amboy, the engineer went to reverse his engine, and his lifting-rod, or a pin came out of the lifting-rod, broke (I can't say which), so that he had no control of his engine. There was a man on the engine with us by the name of William Sharp. Him and myself went over the top of the cars to put the brakes on to stop the train. I went right to this Tyler car first and put the brake on. My reasons for going there was because it had a double brake. The double brake held on both trucks, and all the other cars between had only one brake, which held on one truck only. The brake on this Tyler car was the first double brake I ever saw.

Q. 5. (Witness is shown Model Exhibit A, and asked) if the brake on this exhibit is like the one on the John Tyler, referred to in his last answer.

A. Yes, sir; that brake acts as near like it as I could explain it.

Q. 6. Did you know Joseph Cox, a locomotive engineer on the Camden & Amboy road; if so, when did you know him, and did you at any time act as his fireman? If so, did you know of the use of a brake like Exhibit A on any car or cars in the train run by him?

A. I knew Joseph Cox. I knew him in 1845, 1846, and 1847, and was firing for him when he was killed, and fired for him in 1846 and 1847. The crate-car that was run in that train had a double brake on it like Exhibit A.

455 Q. 7. Is that double brake in use on the passenger-cars of the said Camden & Amboy road at the present time?

A. Yes, sir.

Cross-examined by M'r Cozzens:

Cross 8. How long were you a fireman on the Camden & Amboy road?

A. Three years and six months; from about the latter part of June, 1845, to the forepart of 1848.

Cross 9. When you first commenced firing on that road, what kind of trains did you fire on?

A. I think about the first firing I done was on the mail-train.

Cross 10. When was that?

A. About the forepart of June, 1845.

Cross 11. Were there any double brakes on any of the cars on that mail-train?

A. I don't know of any but this Tyler car. This Tyler car was run on the mail-train.

Cross 12. From what place to what place did that mail-train run?

A. It run from Camden to Jersey City.

Cross 13. And the Tyler car ran in it to Jersey City, I suppose?

A. Yes, sir.

Cross 14. Often?

A. No; it did not run there steady. Whenever they had an excursion they would select out the cars and run them on excursions.

Cross 15. I didn't ask whether it ran steadily, but whether it run often to Jersey City.

A. Sometimes it would run on that train for a week or two at a stretch.

Cross 16. How long did you fire on that mail-train?

A. I fired that train about eleven months, but was off out of that time on excursion-trains about three months.

456 Cross 17. Did that Tyler car run in that train to Jersey City all, or nearly all, of that eleven months except the three months spoken of?

A. That I can't tell you.

Cross 18. To the best of your recollection, how much of that eleven months did that car run in that train to Jersey City?

A. I think it run pretty much all the winter of 1845. I mean the winter of 1845 and 1846. I fired on that train all that winter, and I think that car was in the train pretty much all the time.

Cross 19. Was that car so constructed that its brakes and the brake-levers under the car could be seen without difficulty?

A. Not without getting under the car, I shouldn't think.

Cross 20. Did that car have fish-bellied side-sills like the Model Exhibit A?

A. That I am not able to say.

Cross 21. If it had not, what difficulty would there have been in seeing its brakes and the brake-lever under the car if a person had stooped down at the side of the car?

A. There wouldn't have been anything to hinder.

Cross 22. Are you very familiar with the practical construction of double-acting car-brakes?

A. Yes, sir.

Cross 23. Do you know the construction of what is called the Hodge brake, in which there are two cross-levers under the car?

A. No, sir.

Cross 24. Do you know the construction of what is called the Stevens brake, in which there are four vertical levers under the car?

A. No, sir; I have never seen any of them that I know of.

Cross 25. What time did you commence to be ticket-collector on the Camden and Amboy road?

A. Three years last New Years; that is, in 1864.

Cross 26. Then from 1843 to 1864 you were on that road either as brakeman, fireman, or conductor, were you not?

A. Yes, sir; except five months.

457 Cross 27. During all that time did you never see on any of the cars on that road a double brake with two cross-levers under the car-body?

A. No, sir.

Cross 28. Where is the William Sharp you spoke of?

A. Dead and buried, some time ago.

Cross 29. Was the time when, as you say in your direct examination, you put the brake on the John Tyler the only time you noticed the brake of the car?

A. No, sir; long before that I noticed them.

Cross 30. How long before?

A. The first I ever saw of a car with a double brake on was the day they took President Tyler from Camden to Princeton.

Cross 31. How many times after that did you notice the brake of that car up to the time referred to in your direct examination?

A. I couldn't tell. I had been using that car two nights in a week the whole summer season.

Cross 32. What summer was that?

A. Well, I think I was with that car from off and on from the time they carried President Tyler till the time I commenced firing, in May or June, 1845.

Cross 33. Where was that car running mostly the time?

A. On the mail-train from Camden to Jersey City.

Cross 34. How long since you last saw the brake in the Tyler car?

A. I don't know that I have seen the Tyler car in over three years.

Cross 35. When were you first spoken to about testifying in this case?

A. Yesterday, about twelve o'clock.

Cross 36. How long before that had any one talked to you about the brake on the Tyler car?

A. I think about a week ago M'r Lockwood asked me what I knew about the Tyler car, and I said I didn't know anything about it. I hadn't seen it for some time. I thought he wanted to know where the car was.

Cross 37. What did M'r Lockwood say then?

458 A. M'r Lockwood told me that he would like me to study out what I could about that car. When I saw him again, which was the next evening, I asked him what he wanted to know about the Tyler car. He wanted to know what I could tell him about it. I told him I could tell him what kind of doors it had, what kind of cushions, what kind of seats there was in it. Some of them was made like a chair, to turn around on a pivot, some of them was just a lean-back, with rods to run down the back of the seats, and some of them had a wide back that turned over, something similar to what they had nowadays. Some of them were split right in two, to turn different ways. I told him it had a lamp in each end of the car. I told him it had a six-wheel truck under it. I told him it had a crank on each end of the hand-railing. I told him it had a cross-lever underneath, about midway of the car; that it had a long rod from the end of the lever till it came within about 18 inches of the brake-post, and there was about 18 inches of chain that run to the brake-post, a bolt run through that, and a nut screwed on the end of it; a short rod connected in about six inches from the end of this cross-lever that connected into the brake-lever.

Cross 38. Didn't M'r Lockwood say anything at all to you when he first spoke to you concerning the Tyler car, about wanting to know what brakes it had?

A. Yes, sir; he asked me if I knew what kind of brakes the Tyler car had on, and I told him I would have to study a little. That is all. He went on board the steamboat and I didn't see any more of him till the next night.

Cross 39. Didn't he say anything to you about a patent, or about there being some questions about brakes?

A. He didn't at that time. He didn't at any time about there being a patent.

Cross 40. Did he at any time say anything about there being a question or controversy about brakes?

A. No, sir.

Cross 41. Didn't he tell you why he wanted to know what kind of brakes the Tyler car had?

A. He didn't at that time.

Cross 42. At what time did he tell you?

A. The next night, when I saw him.

459 Cross 43. What did he say to you about it, then?

A. The next night I went to the depot to meet my wife. While I was waiting there Mr. Lockwood came there. I then told him all I could what kind of a car the Tyler car was, and after I told him all, he told me what he wanted to know for. He told me there was a lawsuit on this patent brake, and he wanted to know how far back I could remember. I told him the first that I knew of the Tyler car was when they took the President to Princeton, and that is all that was said about it between him and me.

Cross 44. Didn't he say anything about its being an important matter to prevent the parties sueing on that patent from succeeding?

A. He did not to me.

Cross 45. He didn't say anything like sueing or anything of that kind?

A. No, sir.

Cross 46. Will you swear positively that that was all that passed between you and Mr. Lockwood about this Tyler car on these two occasions?

A. Yes, sir.

Cross 47. Did he tell you that he had asked anybody else on the road what they knew about this Tyler car?

A. No, sir; he did not say anything to me about any one else.

Cross 48. You say that he told you that he would like you to study out about that car. Didn't he speak of any particular thing he wanted you to study out about it?

A. No, sir.

Cross 49. When you saw him the next night, did you tell him what kind of springs that car had?

A. Yes, sir; I told him it had spiral springs.

Cross 50. How many other cars were there on the Camden & Amboy road between 1843 and 1848 respecting which you could now tell what sort of doors, cushions, seats, trucks, and springs they had?

A. Well, I don't suppose I could go to work now, after passing through from fifteen to twenty cars a day, to tell you the colors
460 of the seats. Well, I don't think there was more than two cars on the road which had double doors to them, and they were small cars with steps to them.

Cross 51. Can you now tell what sort of cushions, seats, trucks, and springs the other cars on the road besides the Tyler, between 1845 and 1848, had?

A. I think they were small cars, steps on the ends of the platforms, with four-wheel trucks under them, a brake on one end of them, yellow cars, glasses and slides to let down, seat about forty passengers. The color of the cushions were mostly red and plush.

Adjourned to the 12th inst., at 12 m.

MONDAY, *August 12th*, 1867.

Present, counsel for the respective parties.

Cross 52. Then the Tyler car was very easily distinguished from the other cars on the road at that time, was it?

A. Yes, sir; you could tell it in the train from any other car.

Cross 53. State, as near as you can, for about how long a time it continued to be so different from the other cars on the road that it could be so easily distinguished in the train at any time?

A. Well, I think all the time that it was on the road.

Cross 54. Do you know how long it was after the President was carried in that car that it came to be called the Tyler car?

A. I think they commenced calling it right away after that the John Tyler car.

Cross 55. Now, Mr. Walcott, in your 37th cross-answer you say that Mr. Lockwood told you that he would like you to study out what you could about that car. Are you positive that that was all he said?

A. Yes, sir; that is all he said to me one way or the other.

461 Cross 56. How did you know from that brief remark what kind of information he wanted about the car?

A. I didn't know at all what kind of information he wanted.

Cross 57. What did you think he wanted?

A. I didn't know whether he wanted to know something about the seats inside of it; I did not know what he did want. I can't tell what I thought he wanted.

Cross 58. How long before that was it that you had had your attention called to or had thought anything about the brakes on the Tyler car?

A. I don't know that I had had my attention called to or thought anything about the Tyler car for the last three years.

Cross 59. What called your attention to it or made you think about it three years ago?

A. Running it in the train, more or less.

Cross 60. Why did that call your attention to that car particularly?

A. The reason my attention was called to that car at that time (I won't say three years, it may be longer) was coming out of Amboy I heard a squeaking around the train. I stopped the train and found that a box under the John Tyler car, the brass on top of the journal, was cut out. I drilled the car off and left it on the side track.

Cross 61. Did you at that time look first at the boxes?

A. Yes, sir.

Cross 62. That is rather a common cause of stoppage on railroad trains, is it not?

A. Yes, sir.

Cross 63. After you had found that the trouble was a journal cut out, there was no need of examining that car any farther before putting it out of the train?

A. No, sir.

Cross 64. Did you examine the brake of the car on that occasion?

A. No, sir.

Cross 65. Now, how long before that was it that your attention had been called to or that you had thought anything about the brake of the Tyler car?

462 A. I don't know, sir. Whenever I would run the car, of course, I would see the brakes.

Cross 66. Did you, whenever you would run the car, get down and look underneath it to see the brakes?

A. Not without something was the matter with the car.

Cross 67. Could you see the cross-lever and its connecting rods unless you did get down underneath and look at the car?

A. Not without stooping down.

Cross 68. Did you, whenever you run that car, stoop down and look at them?

A. I always made it a practice when backing on a turn-out, day or night, to see whether the brakes, wheels, and all were right.

Cross 69. Did you do the same thing to all the other cars in the trains you were on as brakeman or conductor?

A. Not as a brakeman I didn't do it, but as conductor I did.

Cross 70. At these times did you pay any more attention to the wheels, brakes, &c., of the Tyler car than any of the other cars in the train?

A. I did not, sir.

Cross 71. You said just now it might be longer than three years. How much longer than three years might it be?

A. I should think about four years ago, as near as I can tell.

Cross 72. Now, how long before that four years ago had you had your attention called to or had you thought about the brakes of the Tyler car except as you looked at them on turn-outs as you have stated?

A. I can't say; I don't know when.

Cross 73. Can you say that you had had for ten years before?

A. I couldn't name any day, or date, or month. I had been running the car more or less during that time.

Cross 74. Do you mean by this answer that you cannot say that you had had for ten years before?

A. No, sir; I cannot say.

463 Cross 75. Then, at the time Mr. Lockwood spoke to you, you had not had your attention called to the brakes of the Tyler car any more than to the brakes of other cars you have run for fourteen years. Now, how did that brief remark of Lockwood's that he wished you would study out what you could about that car lead you after a lapse of all those years to be able to tell him the next evening so particularly about the rigging of the car?

A. I first went on the night when I met him; he asked me what I had studied out. I said, don't say anything to me, and I will tell you what I know, and see whether I am right or not. I told him it had double doors on each end. I told him what kind of seats was in the car, all the slides let down in the car, each slide had three panes of glass in. The cushions were kind of a drab color; some of the seats were fixed like two round chairs sitting side by side, then turned around on a pivot; some were seats with a wide back that turned over; some were just to lay back, with two iron rods run down to the bottom of the seat, a bolt went through the bottom, and a split key put in the bolt; then there was another kind of a seat that you could turn them so that you could look one another in the face. It had a lamp in each end of the car, a platform on each end of *of* the car. Iron railing about one-third of the way on each side of the car; a chain went from one side to the other, and was the same on both ends; a brake-crank on each end of the car; one cross-lever under the bottom of the car; one long rod from the cross-lever to about 18 inches of the brake-post. A bolt en the end of the chain went through the post with a nut on the end of it; a short rod running from there to the brake-lever on the back end of the truck going one way, and the front end going the other way, the same on both ends; six-wheel truck, tallow-boxes, spiral springs. I believe that is about all as I explained it to M'r Lockwood that night, and he told me I knew all about it.

Cross 76. Did you get at all this from that slight remark of his—that he would like you to study up what you could about the car?

A. Yes, sir, I did.

464 Cross 77. Are you sure that he did not at that first interview say anything more to you than that remark, that he wished you would study up what you could about that Tyler car?

A. That is all he said; he said no more.

Cross 78. Do you swear positively to that?

A. Yes, sir.

Cross 79. Did not he say anything to you in that interview about the brakes of the car?

A. He did not, sir; just at that time my wife came along, and I went away home with her.

Cross 80. Will you swear positively that he did not say anything at all to you about the brake at that time?

A. He did not at that time; I will swear positively to that.

Cross 81. Now, did you not on Saturday swear that when M'r Lockwood first spoke to you concerning the Tyler car, he asked you if you knew what kind of brakes it had on, and you told him you would have to study a little?

A. He asked me what I knew about the Tyler car. I told him I did not know anything about the Tyler car; I hadn't seen the Tyler car for some three or four years; well, that was all that was said on that day. I don't recollect saying that; if I did, I did not know what the question was.

Cross 82. Could you now, after this lapse of time, describe the brakes on any of the cars in the trains you run?

A. They are pretty much rigged the same as on the Tyler car; yes, sir, I can describe them.

Cross 83. Would you have to study any time to do so?

A. I would not.

Cross 84. Why did you need "to study a little" to tell M'r Lockwood what kind of brakes the Tyler car had?

A. He did not ask me what kind of brakes she had; he asked me what I knew about the car.

Cross 85. Question repeated.

A. I did not have to study to tell him.

Cross 86. Now, M'r Walcott, when M'r Lockwood first spoke to you about the Tyler car—it was nearly twenty-two years since you say you had first seen the car, and you have just testified that it was fourteen years since you had had your attention called to the brakes 465 of that car any more than to the brakes of other cars of the trains you run—do you not think it is a difficult matter, under such circumstances, and after such a lapse of time, to remember positively what kind of a brake a particular car had on twenty-two years ago?

A. No, sir; I can remember just as well as can be; one reason that I can remember it well in 1844 is, I lost my father August 3d; the night before, I slept in the John Tyler car, what little I did sleep. I was cleaning the car on that day, when I got word that my father laid at the point of death; he died that day, the 3d of August, 1844.

Cross 87. You said, in your 82d cross-answer, that the brakes of the other cars of the trains you run were rigged pretty much the same as the Tyler—you knew, didn't you, that the Tyler car, and the other cars of the trains you run, had the same kind of brakes for a great many years?

A. Yes, sir; there was some little difference in the levers; sometimes the levers were on the front end of the trucks, and sometimes on the back end.

Cross 88. Now, when you were studying up about the Tyler car, after

Lockwood spoke to you, it was in your mind that the majority of the passenger-cars on the Camden & Amboy road had, for many years, had on them brakes like Exhibit A?

A. Yes, sir.

Cross 89. When you were studying up about the Tyler car, was it in your mind what kind of seats it had, so that you could have said off-hand what kind of seats they were?

A. Yes, sir.

Cross 90. And what kind of doors it had?

A. Yes, sir.

Cross 91. And what kind of springs?

A. If M'r Lockwood had stood still fifteen minutes, I could have told him all about it—what springs it had, and what seats, and what brakes it had, and what kind of lamps it had; but he went on board of the steamboat.

466 Cross 92. Did you, in that studying out, pay any more attention to what brakes it had than you did to what seats it had, what springs it had, what trucks it had, &c.?

A. I did not, sir.

Cross 93. You just worked it out in your mind, didn't you, as it was when you last recollected seeing it, and when you next saw Lockwood you so described it to him, didn't you?

(Counsel for the defendant objects to counsel forming his question in such a way as to assume what the witness may not be disposed to admit.)

A. Yes, sir.

Cross 94. Was that all there was said about it?

A. That was everything that was said about it.

Cross 95. Did Lockwood then, or at any time afterwards, tell you what he knew about the Tyler car?

A. No, sir.

Cross 96. Have you talked with any other employees of the Camden & Amboy road about this Tyler car, lately?

A. No, sir.

Cross 97. Who has talked with you about it since the last conversation you had with Lockwood on the subject?

A. There has no one spoken to me about the Tyler car, but I have spoken to one about it. I was at South Amboy on Saturday last. I was laying in a car, on a cushion; James Van Dusen came along down the track. I don't know that I had seen him for two years. I asked him where the old Tyler car was; he said he tore it up, and burnt part of the wood up; he said the boat was coming in, and he must get to the dock; and that was about all I said to him about it.

Cross 98. Should you say that it had been well known, and generally known, among the employees of the Camden & Amboy road ever since 1846, that this Tyler car had double brakes?

A. Yes, sir.

467 Cross 99. Did you ever see on the Camden & Amboy road a cross-lever brake called the McLoughlin brake?

A. If I did I didn't know it; I don't know it by that name.

Cross 100. The McLoughlin brake is a brake with a cross-lever, and a yoke near each end of the car, and it works by the bumpers; does this enable you to remember whether you ever saw any such brake on the Camden & Amboy road?

A. They have had brakes there where the lever run out about even with the bumpers; they were rigged in the same way on the tenders to stroke these brakes, so that when you were backing the train it would put the brake on; oftentimes they would get caught on, so that you could not get them off when you would start the engine ahead; I have went under the car and pryed them off myself, and I have seen others do it, but I never knew the name of the brake.

Cross 101. Do you know when the brake you have just described was first put on the road?

A. I do not.

Cross 102. Can you state when it was taken off?

A. No, sir; I cannot.

Cross 103. Do you know anything about how many cars it was put upon?

A. No, sir; I do not.

Cross 104. Do you not know that it was put, and for a long time continued on, one or more whole trains on the Camden & Amboy road?

A. No, sir; I do not.

Cross 105. Did you ever hear of this brake, which has been called the McLoughlin brake, spoken of as the Spider brake?

A. No, sir; I never heard it spoken of until I heard it spoken of in this room.

Cross 106. Did you ever know of a brake in use on the Camden and Amboy road called the Spider brake?

A. No, sir.

468 Cross 107. At the time when you say you were going down the cut, spoken of in your direct examination, whereabouts on the train were you?

A. I was on the locomotive at the time.

Cross 108. Were you constantly on the locomotive?

A. That was my place, on the locomotive.

Cross 109. What is there that makes you think that the time spoken of, when you went to the Tyler car to stop the train in the cut, was in 1845, rather than in any other year?

A. I only fired for him one summer, commencing the latter part of May or the first part of June, 1845.

Cross 110. Do you say that during one summer was the only time that you fired for Yundt?

A. It was the only summer that I fired for him; I had fired some trips after that.

Cross 111. About how many trips after that?

A. About as near as I can tell you, it was the latter part of May, 1846, I fired for him right straight along; I can't tell the number of trips.

Cross 112. Well, what makes you think that the circumstance which happened in the cut occurred in 1845, rather than in any other year?

A. Well, it was the only year that I ever fired on the bay excursions, which were the excursion trains spoken of heretofore.

Cross 113. Did not these excursion trains run twice a week, and the other days in the week (unless perhaps Sunday) did not the engineer and fireman of the excursion trains run the mail-trains you have before spoken of?

A. The other days we stood as an extra engine, and run it when there was anything the matter with the regular mail-train engine.

Cross 114. How many days in the week, on an average, did this arrangement cause you and your engineer to run the mail-train?

A. That is something I can't tell you; we had to fire up every morning and stand ready. On an average it would be two days in a week, anyhow.

Cross 115. Did that mail-train ever run to Amboy ?

A. No, sir.

469 Cross 116. What is there that makes you think that it was when you were firing on the excursion trains with Yundt, rather than when you were firing on those trains with Cox, that the circumstance occurred in the cut ?

A. To the best of my knowledge, I never went to Amboy with Joseph Cox in the world, neither on locomotives or any other way.

Cross 117. Is there no other cut on the road except the one two miles this side of South Amboy ?

A. There is one on Gravel Hill, fourteen miles from Amboy; one at Blackstock, four miles from Bordentown, towards Amboy. There are cuts between Camden and Bordentown.

Cross 118. Are there any cuts on the route pursued by the mail-train running from Camden to New Brunswick ?

A. Two miles this side of Camden, which is a sand-cut. There are four cuts between Camden and New Brunswick; one of them is down a heavy grade.

Cross 119. Now, if you ran on the mail-train so often as at least twice a week, and if there were so many cuts on the route pursued at that time by the mail-train, how are you able to state positively, after this lapse of time, that the circumstance occurring in the cut did not take place with one of these mail-trains in some one of these other cuts ?

A. If it had took place in any other cut except where it did, I wouldn't have taken any notice of it. The engineer had to shut his engine off, and the train would not run a mile without stopping; the further the train went down this grade the faster it would go. I and every one in that train was in danger of their lives under the circumstances.

Cross 120. Would it or not be true that the further a train ran down the heavy grade in the cut just spoken of between Camden and New Brunswick, the faster it would go ?

A. Yes, sir.

Cross 121. Would it not, therefore, be possible for such a circumstance as you say took place in the Amboy cut, to take place in this other cut between Camden and New Brunswick ?

A. Yes, sir.

470 Cross 122. How long before you attempted to fix a date for applying the brakes of the Tyler car had you thought about the event in the cut ?

A. I hadn't thought of it at all.

Cross 123. Had the fact of the engineer losing control of his engine, and your trying to stop the train, been in your mind, or thought of by you, for ten years until now, recently ?

A. I don't suppose I have went down the cut three times since but what I have thought of it.

Cross 124. Did you then always, when you went down the cut and thought of it, think to yourself that the Tyler had double brakes when the event happened ?

A. No, sir.

Cross 125. Did you ever, on those occasions, think anything about whether the Tyler had double brakes or not, when the event happened ?

A. I have often thought that if we had not had the Tyler car we would have had an accident, and it would not have been many minutes either; they would have ran into the river; some cars on a train, previous to that time, did go into the river.

Cross 126. In you' sixth direct answer, you speak of a crate-car running in a train of which Joseph Cox was engineer; was the train there referred to, "that train," the train Cox was using when he was killed?

A. Yes, sir; he was running that train the day he was killed.

Cross 117. Was the time referred to by you, when that crate-car was in that train, the time Cox was killed?

A. Yes; it was to the best of my knowledge.

Direct resumed by M'r Whipple:

Q. 128. Were there peculiarities connected with the Tyler car that did not belong to any other car or cars of that road—if so, state them as they occur to you—during 1844, 1845, and 1846?

471 A. When the slides were down, very near one-half of the car was thrown open—while in any other car there was only here and there a small slide to let open; when those slides were all shut up, it was glass from one end of the car to the other. It had wide platforms, while the rest of the cars had steps; one lamp in each end of the car, which the others had not; a privy on the outside of the car, on the platform; no other cars had privies but the ladies' cars, whith were inside; it always went by the name of the Tyler car. I don't suppose there was ten men on the road but what knew it; you could tell it as far as you could see it; the doors had no locks on them. When the men went in there to sleep at night, we used to tie the door to; if it stood along by the platform, you could let a window down and crawl right in; there were four different kinds of seats that I knew of in the car; whenever they wanted to try an experiment, they would try it on the Tyler car. I have slept in that car many a night, and have set down into it many a time and eat my dinner.

Q. 129. Is it these peculiarities distinguishing it from all other cars on that road that enables you now to identify it, and explain it in detail?

A. Yes, sir.

Q. 130. Do you know of your own knowledge that there was a cross-lever brake on this car, having four connecting-rods, at the time of the death of your father, to wit, in August, 1844?

A. Yes, sir; I do. I slept in the car the night before, and cleaned the car the same day of his death.

Q. 131. In answer to the sixth direct interrogatory, you speak of a crate-car being in the train run by Joseph Cox; was there anything connected with that car, such as drilling it into place in the train, or otherwise, that enables you to determine that there was a double brake on it like the one on Exhibit A? If so, please state.

(Objected to.)

472 A. Whenever we would go into the depot and let our passengers out, then we would back the train up the road—what we call drilling; the brakeman would take the passenger-cars, then I would get off and cut this crate-car loose, and let it into the pit where they loaded the crates, on the outside of the house; then they would put it up out of this pit back into the passenger-cars; I would let this crate-car down in this pit pretty much every day, in order to save time to get her engine to the wood-pile, and to get water, and get her engine in the shop, so that I could get at my work in wiping off; there was always a crate kept on this crate-car to put way-baggage in.

Q. 132. Was all this spoken of in your last answer, prior to the death of Joseph Cox?

(Objected to.)

A. Yes, sir.

B. L. WALCOTT.

Subscribed and sworn to before me this 12th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

GEORGE STOCKHAM, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. George Stockham; 55 years of age; reside at Bordentown, New Jersey, and am a house-carpenter.

Q. 2. By whom are you now employed, and in what capacity?

A. By the Camden & Amboy Railroad Company, and have charge of repairs of the tenders in the locomotive department.

473 Q. 3. When did you enter the employ of said company?

A. In 1843.

Q. 4. About that time, or a year or so thereafter, did you know of the use of double-acting brakes on the cars of that road?

A. Yes, sir.

Q. 5. State how and when your attention was called to those brakes, and where.

A. I went into the paint-shop of an errand in about winter of 1844 or spring 1845, when Charley Vandergrift called my attention to it. I got in under the car where he was at work, and I saw the cross-lever and the lever on each truck, and *from* connecting-rods. (Witness is shown Exhibit A, and he says it was like the brake on that.)

Q. 6. Have you any way of fixing the date referred to in your last answer? If so, please state it.

A. There was a gentleman wanted me to come out to Downingtown, Pennsylvania, and work for him in that spring, 1845. That is all I know about it.

Q. 7. How does that enable you to fix the date?

A. This was right away after I saw this brake.

Q. 8. How do you fix the time of entering the employ of the Camden & Amboy Railroad Company, as you have stated, in 1843?

A. I came on here with M'r Palmer to work on M'r Stevens' house, at Hoboken. That was in March, 1843. We went back in the fore part of June, same year, to Bordentown. There we erected an office on the arch which spans the railroad-track at that place. Then I commenced with Isaac Dripps, the master-machinist on that road. This was on the 20th of October, 1843. I got the date from the books of the company kept at that place.

Q. 9. Are brakes like Exhibit A now in use on the cars of the Camden and Amboy road?

A. Yes, sir.

Q. 10. And have they been in use from the time you saw them on the car in the paint-shop, in 1845, to the present time?

474 A. To the best of my knowledge, they have.

Adjourned to the 13th inst. at 11 a. m.

TUESDAY, *August* 13, 1867.

Present, counsel for the respective parties.

Cross-examined by Mr. Cozzens:

Cross 11. What led Vandergrift to call your attention to the brakes in the paint-shop; were they a new thing at that time?

A. I don't know, sir.

Cross 12. Had you paid any special attention to brakes before that?

A. Only on tenders.

Cross 13. They did not have double brakes on tenders, did they?

A. No, sir.

Cross 14. You were not interested in the subject of double brakes, were you?

A. No, sir.

Cross 15. What has your being wanted to go to Downingtown, in the spring of 1845, to do with your having seen the brakes as you say?

A. I only remarked that that gentleman told me that if I would come on there he would give me a job. I was on my way to New York, and I met the gentleman from Downingtown in the cars, and I haven't been to New York since, to the best of my knowledge, till last Friday. I only fix it from that time, that's all.

Cross 16. How long did you look at the brake when Vandergrift called your attention to it?

A. It was not a great while; I can't say how many minutes.

Cross 17. Was it more than a few minutes?

475 A. All I can tell you, it was just long enough to see the cross-lever under the car connected with four connecting-rods.

Cross 18. Have you any memoranda of the time you met that gentleman in the car?

A. Nothing, only coming to New York in the spring of 1845.

Cross 19. How long did you remain in New York at that time?

A. I returned that same day.

Cross 20. Did you go to any hotel or public house or tavern while you were here?

A. I don't think I did.

Cross 21. Did you have any business in New York?

A. No, sir, I had no business in New York; I just came over.

Cross 22. Did you see anybody there, and, if so, who?

A. No one that I knew that I recollect of now.

Cross 23. How often have you thought about this matter of meeting this gentleman in the car since you so met him?

A. Well, I can't tell you how often; I just recollect the circumstances.

Cross 24. Have you thought of it often?

A. Oh, no.

Cross 25. Is it not possible that it may have been in 1846 instead of 1845 when you met this gentleman?

A. No, sir; I don't think it possible.

Cross 26. Did you go to Downingtown to work?

A. No, sir.

Cross 27. Did you see there double brakes often in 1844 and 1845?

A. No, sir.

Cross 28. Did you see them more than that once in 1844?

A. I don't think I did.

Cross 26. When was the next time, to your recollection, that you did see one of those double brakes after, as you say, Vandergrift first called your attention to it?

A. I cannot say; I cannot tell you any time at all, for I am not in that shop.

476 Cross 30. Can you say that you saw one of them again before 1848?

A. I don't recollect taking any more notice of the brake; I can't say that I saw one of them again before 1848.

Cross 31. Can you say that you saw one of them again before 1850?

A. They were on the cars at the time 40 and 41 (two locomotives) ran together at South River; I can't tell when that was; it was somewhere about the fiftys; this occurrence was not before 1850, I think; yes, I think I can say I saw another one before 1850.

Cross 32. When was it, and what car was it on?

A. I can't tell you, sir.

Cross 33. Can you swear positively that you saw another one before 1850?

A. I don't recollect taking any particular notice; I can't swear positively that I did before 1850.

Cross 34. Can you swear positively that you saw another one before 1856?

A. No, sir; I think, to the best of my knowledge, it was at South River.

Cross 35. Can you swear that the collision at South River was before 1855?

A. I think it was, to the best of my knowledge.

Cross 36. How long before?

A. I cannot say; it was between 1850 and 1855; I can't swear it was before 1854.

Cross 37. After this collision when did you again see one of those double brakes?

A. I can't say, sir.

Cross 38. Can you say that after the collision you saw another before 1858?

A. I can't say, sir.

Cross 39. Can you say you saw another one before 1860?

A. I cannot, sir.

Cross 40. Can you say you saw another one before 1864?

A. No, sir.

477 Cross 41. With the exception of the two instances you have mentioned, have you any personal knowledge that these brakes, like Exhibit A, have been in use on the cars of the Camden & Amboy Road from 1845 to the present time?

A. I have not; but to the best of my knowledge I think they have.

Cross 42. Do you know that double brakes have two cross-levers under the cars, and known as the Hodge brake, and double brakes having no cross-lever, but four upright levers, known as the Stevens brake, were put on to cars on the Camden & Amboy Road a great many years ago, and that at least some of the Hodge brakes are used on the cars at the present time?

A. I do not.

Cross 43. Then, for aught you know, with the exception of the two instances you have mentioned, these double cross-lever brakes and the brakes with four upright levers might have been in use on all the cars of the Camden & Amboy Road from 1845 to the present time, might they not?

(Objected to on the ground that it is calculated to confuse and mislead the witness.)

A. I must acknowledge I do not understand the question.

The question being explained, witness says: I cannot say that the other cars might not have had those other brakes on.

Cross 44. Did you ever hear of a brake called the McLoughlin brake being used on the Camden & Amboy Road?

A. Yes, sir, I did.

Cross 45. Can you tell when that brake was first put onto the cars?

A. No, sir.

478 Cross 46. Can you state how long it was kept on?

A. I cannot, sir.

Cross 47. Can you state how many cars it was put on?

A. No, sir.

(Counsel for defendant objects to this mode of examination for the reason that the witness is not employed in the car department of that road, but in the locomotive-tender department, and is, therefore, not supposed to know what is used on the cars of that road.)

Cross 48. Did you ever see that McLoughlin brake on any car or cars?

A. I have seen it, and I think on more than one car.

Cross 49. Please state, as nearly as you can, when you first saw it.

A. Well, I should judge it was some thirteen years ago; it may be more; I don't know.

Cross 50. Do you feel pretty certain that it is more than thirteen years ago?

A. I cannot tell the time; I don't think it was more than thirteen years ago.

Cross 51. But you think it was about thirteen years ago?

A. I can't say for certain whether it was more or less.

Cross 52. Was there any name for this car which you say you saw this double brake on in the paint-shop in 1845?

A. I can't say that I took any notice of any name or number on the car.

Cross 53. Do you think it was the Tyler car?

A. It might have been, but I don't know.

Cross 54. Was there any number for whatever car you saw the brake upon which you say you saw at the South River accident; and if so, what was the number, if you know?

A. I can't tell you the number.

479 Cross 55. Was that car on which you say you saw the double brake, in the shop in 1845, being repaired?

A. I think it was at that time.

Cross 56. Who was that Downingtown gentleman you met in the car?

A. He was a stranger to me. I don't know his name.

Direct resumed by M'r Whipple:

Q. 57. Has your time been exclusively occupied in the locomotive-tender department since you took charge of it to the present time?

A. Yes, sir.

GEORGE STOCKHAM.

Subscribed and sworn to before me this 13th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

THOMAS W. DUNN, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence and occupation?

A. Thomas W. Dunn; 42 years of age; reside at Bordentown, New Jersey, and am foreman of the car-trimming department of the Camden & Amboy Railroad Company.

Q. 2. How long have you been in the service of that company, in that capacity, and from what year do you date?

A. Since October, 1844.

Q. 3. Do you know of a car formerly in use upon that road by the
name of John Tyler; if so, when did it take that name, when
480 were you first acquainted with it, and what are the circumstances
connected therewith, and what are the peculiarities that distinguish said Tyler car from other cars on that road at the time named?

A. I do; it took that name in 1844. It was a car that was used to convey the President over the road. I became acquainted with it in 1844; it came into the shop for repairs at that time. I retrimmed it during the winter of 1844 and 1845, and it was repainted at that time; and it had looking-glasses placed in the ends of the car, with a light in the centre of the glass, with the name of John Tyler under the light—I should have said a lantern was placed in the centre of the glass. It was an experiment car, and there were several different kind of seats in it. It also had six-wheel trucks on it, with a brake on both trucks, which could be applied from either end of the car. The trucks were different from any other cars I ever saw. It had large spiral springs set on half springs, similar to our elliptic springs.

Q. 4. By whom, or through what means was you' attention called to the kind of brake on the said Tyler car at this time?

A. By seeing a man by the name of Charles Vandergrift, who was working at the repairs, and who got upon the platform and applied the brakes to see if they worked right. He first tried them on one end, then passed through to the other end, and applied them there also.

Q. 5. And did the brake apply the power to both trucks at the same time?

A. It did.

Cross-examined by Mr. Cozzens:

Cross 6. When you, as you say, saw the brake on the Tyler car in the winter of 1844 and 1845, how came you to be where the car was?

A. My business called me in and out of the car several times during the day.

Cross 7. Did Vandergrift call your attention to the brake?

A. He did not.

481 Cross 8. Did you know before that there was such a brake on that car?

A. No.

Cross 9. Had you never before, when cars were in the shop for repairs, seen anybody get on the platform to try the brakes?

A. Not to the best of my recollection.

Cross 10. Isn't that a very common thing to be done when cars are being repaired?

A. I believe it is.

Cross 11. Did it strike you as anything unusual when you saw Vandergrift do it, as you say?

A. Yes, sir.

Cross 12. How long did you remain near that car on that occasion?

A. Only about long enough to see the operation of the brake.

Cross 13. Did you examine the construction of the brake?

A. Yes, sir.

Cross 14. How many minutes did it take you to see the operation of the brake?

A. Not over more than ten minutes.

Cross 15. Did you then go away from the vicinity of the car?

A. I did.

Cross 16. Did your position in the trimming-shop bring it within the line of your knowledge to know much about the brakes on the cars?

A. It did not belong to my business.

Cross 17. After you first saw that brake, as you say, when did you see such an one again?

A. I could not say positively when I did see it again. I never had my attention called to any other kind of brake until about 1852 or 1853, as near as I can tell. I have reference to a double brake. I didn't examine cars to see what kind of brakes they had on. What I mean to say is that I didn't see any brakes of any kind to examine them, and did not have my attention called to any again until 1852 or 1853.

482 Cross 18. You say you didn't have your attention called to them to examine them, could you have told how they were constructed without examining them?

A. No.

Cross 19. Then I understand you to mean that between the winter of 1844 and 1845 and the year 1852 or 1853, you never saw any brakes to know how they were constructed; is this so?

A. No, sir; I didn't mean so at all. The probability is that I saw the brakes and might have examined them during that time. There is nothing by which I can fix any particular period when I did it.

Cross 20. Then do you mean that you cannot say with certainty how any brakes that you saw between those times were constructed?

A. No, sir; I don't mean to say so.

Cross 21. Well, you have said that in that interval you did not see any brakes of any kind to examine them, and that you could not tell how they were constructed unless you did examine them. Now can you tell how any of the brakes you saw (if you did see any during that time) were constructed?

A. I mean to say that I did not see any other kind of brakes until 1852 or 1853.

Cross 22. I will try that once more. Between the winter of 1844 and 1845, and the years 1852 and 1853, did you examine any of the brakes you may have seen (if you did see any) to see how they were constructed?

A. Not particularly.

Cross 23. Are you able to describe the construction of the brakes you saw during that interval (if you did see any)?

A. Yes, sir.

Cross 24. Were they all like the one you saw in the winter of 1844 and 1845?

A. Yes, sir.

Cross 25. How many did you see?

A. I did not count them; I can't tell anything about the number.

483 Cross 26. Can you swear positively that they all had cross-levers?

A. All that I saw.

Cross 27. Did the cars you saw them on have deep side sills?

A. No, sir; not during that period.

Cross 28. Did you stoop down and look under the cars to see how the brakes were rigged?

A. I did.

Cross 29. What led you to do so?

A. To see how they operated.

Cross 30. Why did you want to see how they operated?

A. Merely curiosity.

Cross 31. What kind of brakes did you see in 1852 or 1853?

A. I saw a brake called a patent brake. The first patent brake I ever saw.

Cross 32. What name did it go by?

A. I don't know, sir.

Cross 33. How was it constructed?

A. I never understood the operation of it at all.

Cross 34. Was it on the Camden and Amboy cars?

A. It was put on one of them.

Cross 35. Did you ever see the passenger-cars of the New Jersey Railroad & Transportation Company with double brakes?

A. Yes, sir.

Cross 36. Did such cars ever come into the Bordentown shops for repairs?

A. They have for slight repairs.

THOMAS W. DUNN.

Subscribed and sworn to before me this 13th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to 11 a. m., the 14th instant.

484 WEDNESDAY, *August* 14, 1867.

Present, counsel for the respective parties.

JOHN CONOVER, called and sworn as a witness on the part of the defendants, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. John Conover. I was born in 1810. I reside in Philadelphia, and am through-baggage master on the through-line between New York and Washington.

Q. 2. Were you ever in the employ of the Camden & Amboy Railroad Company; if so, when did you commence work, and what did you do, and how long were you so employed, and where?

A. I was. I commenced working for them as railroad carpenter in 1839. I was employed between Trenton and Camden for five or six months, on bridges and railroad-tracks. I then went to Camden for the same company, and attended switches, and made myself generally useful in the depot at anything they had for me to do.

Q. 3. While so employed at Camden, do you recollect that the President of the United States took passage on board of a train at that place bound north; if so, what do you know about it, and the car on which he rode?

A. I do. I know it was in 1843. The car he went in was a car lately done up, and had these double-acting or double-shifting brakes. That I know positively, because I was under the car, looked at them, and examined them, and got a man who was employed by the company to work them for me while I was under the car to see how they worked. I have frequently worked them myself when we were drilling the cars. I set the switches and got on the car, and used the brakes myself, and saw that it worked on both trucks at either end of the car at once. The plan is the same as the one on Exhibit A in this case. The car was named the Tyler car after the President went in it, and it continued to have this brake on it.

485 Cross-examined by Mr. Cozzens:

Cross 4. How long did you remain in the employ of the company at Camden?

A. I think it is five or six years, and it may be more, since I left there, but I have been in the employ of the same company at Kensington depot and Walnut-street wharf, at Philadelphia.

Cross 5. While you remained at Camden, did you see most of the other cars of the company which came there, and did you know what brakes were on them?

A. No; I didn't take so much pains about the rest of them; but this one being the first car with that kind of brake I took more pains with that; but how long it was before they got other brakes like that one rigged, I won't pretend to say.

Cross 6. Did you ever see on any of the Camden and Amboy cars a double brake which had two cross-levers under the car-body, and known as the Hodge brake?

A. I don't know but I may have done so, but I can't say anything about that.

Cross 7. Did you ever see on any of the Camden and Amboy cars a double brake which had, instead of a cross-lever, four upright levers under the car-body, and known as the Stevens brake?

A. I don't know anything about that. Being in one station, I hadn't a chance of seeing all the cars the company owned.

JOHN CONOVER.

Subscribed and sworn to before me this 14th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

486 **Joseph Head**, called and sworn as a witness on the part of defendants, deposes and says;

Q. 1. What is your name, age, residence, and occupation?

A. Joseph Head; 52 years of age; reside at Bristol, Pennsylvania, and am in the employ of the Camden & Amboy Railroad, in taking up the wood-fuel and cross ties, and measuring lumber.

Q. 2. When did you enter the employ of said company, and how were you employed at the time, and thereafter?

A. On the 21st day of March, 1845, as superintendent at the Bristol depot, at Pennsylvania. I was there till 1847; and when the Bristol depot was abandoned, I went to Tacony in the same capacity, to take charge of the depot.

Q. 3. How do you fix the date, to wit, the 21st of March, 1845?

A. (Witness here produces a letter of his appointment to take charge of the depot and of the property of the company, dated March 21st, 1845, signed by M'r Gatzner, for E. A. Stevens, the superintendent, and says it was given to him at that time.

Letter objected to, until proof of its handwriting is made.)

Q. 4. When you entered the employ of said company at that place, did you know anything of the use of a double brake on any car or cars of that road during that time? If so, what do you know? Please state of your own knowledge, and tell what kind of a brake it was.

A. I know of a double brake on the Tyler car. I found it there when I went there; it was a brake with a lever and four rods, which would pick up both trucks at once.

Q. 5. Witness is here shown Exhibit A, and asked if it represents such a brake as he has described.

A. It does.

487 Cross-examined by M'r Cozzens:

Cross 6. When do you last remember seeing the Tyler car?

A. I had it with me at Tacony, and I was there eight or nine years; I took it to Tacony with me in 1847 from Bristol. I don't mean to say that I had it there with me all that time. I don't recollect when I last saw it; cars are constantly getting changed in the shop. I can't recollect at all when it left there.

Cross 7. Did it have the same kind of brake on during the whole of the eight or nine years you say you had it with you at Tacony?

A. I did not say it was there during the whole time I was there, at Tacony, but as long as it was there it had the same brake.

Cross 8. Can't you state how long that was?

A. No, sir.

Cross 9. Can't you give any idea of the time?

A. No, sir.

Cross 10. Did you see the Tyler car after it ceased to be at Tacony?

A. Frequently, on the road.

Cross 11. Don't you know anything about when you last so saw it?

A. No, sir, I do not.

Cross 12. What first called your attention to the brake of the Tyler car?

A. At the time that I was appointed, it was the only car that had that brake on at the depot, which I had charge of.

Cross 13. What made you first notice the brakes it had?

A. On account of it being my first employment on a railroad, and I, of course, was anxious to learn my business, and for that reason I took notice.

Cross 14. Did you notice the brakes of the other cars?

A. Yes, sir; they were the old-fashioned lever-brake to take up one truck at a time.

488 Cross 15. Did they have more than one of those brakes to a car, or did they have one at each end?

A. One at each end.

Cross 16. What did the brakeman move to put those brakes in operation?

A. A crank, by the hand, with a handle, like Exhibit A.

Cross 17. How long did they have these brakes which you have called old-fashioned, that operated with a handle, like Exhibit A?

A. I can't say; there may be some in operation now, for what I know.

Cross 18. Were they on passenger-cars?

A. Yes, sir.

Cross 19. Did any of them remain on passenger-cars for as much as ten years?

A. That I can't say.

Cross 20. Did they remain on passenger-cars for a number of years?

A. Yes, sir; a few years, and they may be on still for what I know.

Cross 21. Did they use these brakes you have called old-fashioned on all the cars, except those which had double brakes?

A. Yes, sir.

Cross 22. While you knew about this Tyler car where did it run to?

A. It ran on the mail partly, and partly on the Trenton way train, which went from Bristol to Trenton, and stopped there and went no further.

Cross 23. Were these all the trains it ran on while you knew about it?

A. Yes, sir; that is all I know about.

Cross 24. Did you know what trains it did run on during the time enquired about?

A. Yes, sir; it ran on the mail and way trains.

Cross 25. While you knew about it, did it run on any other kind of trains than the mail and way trains?

A. Not as long as I had charge of it.

489 Cross 26. Now, what is the best information you can give us as to how long you had charge of it?

A. Well, I should judge I had it from five to six years, counting from 1845, but I can't say positively.

Cross 27. Did you have charge of it for at least four years, counting from 1845?

A. I think I had.

Cross 28. Did you ever see on any of the Camden & Amboy cars double brakes, which had two cross-levers under the car instead of one, and known as the Hodge brake?

A. No, sir.

Cross 29. Did you ever see on any of the Camden & Amboy cars any double brakes which, instead of a cross-lever, had four upright levers under the car, and known as the Stevens brake?

A. No, sir.

Cross 30. Did you ever see on any of the Camden & Amboy cars any brake which had a yoke near each end of the car, and were worked by the bumpers, called the McLoughlin brake?

A. No, sir.

Cross 31. After, as you say, you first noticed the brakes of the Tyler car, were you in the habit of paying any particular attention to them?

A. No, not particular; all were looked after alike; not that more than any other.

Cross 32. When did the company begin to have other brakes like the brake you say was on the Tyler car?

A. The next one I saw was under a flat car for carrying baggage-crates on the mail-line; that was in the latter end of 1845; it was there that winter before I left to go to Camden.

JOSEPH HEAD.

Subscribed and sworn to before me this 14th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

490 **Joseph Reed**, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Joseph Reed; 44 years of age; reside at Bordentown, New Jersey; and am a carpenter on the repairs of the track on the Camden and Amboy road, and have been so employed since 1851.

Q. 2. How were you employed for the year 1850?

A. I was employed as brakeman of the Camden & Amboy Company.

Q. 3. Do you know anything of the use of double-acting brakes on the cars of that road in the year 1850? If so, what do you know? Please state fully of your own knowledge.

A. Yes, sir, I do. Well, they had a lever in the middle of the car. It was on the Tyler car and on the crate-car, or a baggage-car as some call them, and on number 9 and 10 passenger-cars that run in the train that I was brakemen.

Q. 4. Will you please give some further description of the brake in use on said cars? State as to the location of the levers and the connections composing said brake.

A. They had four rods, and they broke on each end of the car. The brake on either end would work on both trucks. We put the brake on with a crank.

Q. 5. Witness is here shown Exhibit A, and asked if it is such a brake as he has just described?

A. Yes, sir; it is the same kind of brake.

Cross-examined by M'r Cozzens:

Cross 6. Were the brakes you have been speaking of on any other of the cars on the road except the cars you have mentioned?

A. Well, it is very likely there was. I was on a regular line, and was not shifting about. These cars were on the line I run on.

Cross 7. Are you able to say whether it was on any other cars?

491 A. Well, I don't wish to testify to anything I don't know. I don't know whether there was or not.

Cross 8. Where did this train you say you run on run to?

A. From Trenton to Tacony.

Cross 9. Did it go beyond Trenton going one way and beyond Taconey going the other?

A. No.

Cross 10. How long did you run on that train?

A. I went on in 1850, and was on in 1850 and 1851.

Cross 11. What time in 1850 did you commence?

A. First day of May.

Cross 12. Did you run on it the whole of 1851?

A. I cannot be positive about that, but very near it.

Cross 13. Were there any other cars in the train you run; and, if so, what kind of brakes did they have?

A. There were no other cars in the train I run, and all cars I had anything to do with had that kind of brakes on.

Cross 14. Did you ever know of brakes being used on the Camden and Amboy cars having two cross-levers under the car, and known as the Hodge brake?

A. No, sir.

Cross 15. Did you ever know of a brake being used on the Camden and Amboy cars with four upright levers under the car, and known as the Stevens brake?

A. No, sir.

Cross 16. Did you ever know of brakes being used on the Camden and Amboy cars fitted with a yoke towards each end of the car and operated by the bumpers, and known as the McLoughlin brake?

A. No. sir.

JOSEPH REED.

Subscribed and sworn to before me this 14th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

492 THURSDAY, *August* 15*th*, 1867.

Present, counsel for the respective parties.

JONAS HAGAR, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Jonas Hagar; about 40 years of age; reside in New Brunswick, and am a watchman around the round-house of the New Jersey Railroad & Transportation Company.

Q. 2. Were you ever in the employ of the Camden & Amboy Railroad? If so, where were you employed, and what did you do from time to time while so engaged. When did your services commence and when terminate?

A. I was in their employ from 1848 to first of May, 1864. I was on the brake from 1848 to 1856 or 1857, somewhere along there: then I was conductor on a freight-train. Then I came from there to the New Jersey Railroad & Transportation Company as fireman on their road. I fired there till two years ago last January. Then the engine blew up on the through Washington line, at which time I got hurt and lost my arm, when they gave me the position of watchman at the round-house, where I now am.

Q. 3. Do you know anything of the use of the double brakes, known as the centre-lever brake, on the cars of the Camden and Amboy Railroad in the year 1848? If so, state the circumstances connected with such knowledge, and how you fix the date?

A. I do. In 1848, the 23d day of March, I was married, and in peach time that same year I went on the brake, and I continued on it until peaches were done, which was in September of the same year, and then I went on to a dirt-train as brakeman, under Alfred Thompson, and I had charge of oiling the boxes and keeping the train together. At nights when we were done work we backed our cars in what we
493 called Bordentown wharf. In the morning when we took them out we generally drilled off the extra passenger-cars that were shoved in ahead of our train, and I saw this Tyler car there, and one morning I was looking at this brake on this car; I saw it was a double brake. I said to my engineer, Joseph Trout, I would like to have the brake off that car, because it was a double brake; and he said to me, I wish we could get a brake like that on our train, as it would hold the train so much better than the brake we had on, which was only a single brake.

Q. 4. Will you please give a description of the brake which you then saw on the said Tyler car in the year 1848?

A. It had a lever right in the centre of the car, and had four rods attached to the lever, and you could get on either end and put on all four brakes at once.

Q. 5. (Witness is here shown Exhibit A, and is asked). Does this represent such a brake as you have just described?

A. Yes, sir.

Cross-examined by Mr. Sayles.

Cross 6. What time in 1848 did you first see this Tyler car?

A. Well, it was in the fall; I couldn't exactly tell you the date or the month.

Cross 7. Did you commence as brakeman first in May, 1848?

A. I commenced as brakeman in 1848, in peach-time; that is the first I ever was brakeman.

Cross 8. When was that peach-time?

A. In August and September.

Cross 9. Had you ever been engaged on a railroad before that?

A. I was at work on the track and repairing track, but had nothing to do with the rolling-stock before that.

Cross 10. That, then, was the first you ever saw of the double brake, was it, in the fall of 1848 on said Tyler car?

494 A. Yes, sir.

Cross 11. What called your attention to it at that time?

A. We were drilling our said train out. We had to drill this Tyler car out so that we could get the sand-train out of the way, and then I observed this brake on it, by applying the brake on it to drill it to its proper place.

Cross 12. That, then, was the first that you knew anything about the double brakes when you were applying it to that Tyler car, was it?

A. That was the first I knew anything about it; then me and the engineer looked at it and I called the engineer's attention to it after applying the brake.

Cross 13. How did you apply the brakes to the cars you were running?

A. With a windlass and crank the same as Exhibit A.

Cross 14. Was the brake on the Tyler car applied in the same way, by a windlass and crank?

A. Yes, sir; we put it on in the same way, but it applied all four brakes, whereas the cars we were running applied it to only two.

Cross 15. When you called the engineer's attention to this double brake did he tell you that he thought it was better than the single brakes?

A. Yes, sir, he did.

Cross 16. Did he at that time examine it thoroughly?

A. We got under the side of the car and looked to see how the levers were rigged on it.

Cross 17. That was new to him then at that time, as well as you, was it?

A. That I couldn't fairly say whether it was or was not; he didn't say to me at that time that he had or hadn't seen it before.

Cross 18. Did you see this Tyler car after that.

A. Yes, sir; I saw it after that.

Cross 19. How often did you see it after that?

A. I saw it often after that, but I could not explain how many times. It was while I was brakeman and conductor too.

Cross 20. Where did you see it mostly?

495 A. Well, I saw it around Bordentown, and saw it at Trenton, and I saw it at Amboy. I did not see it in the train after that often. I think it was running down on the other side, in Pennsylvania, but won't say certain.

Cross 21. Did you see the same brake on any other cars?

A. Not at that time, to take notice of them, but did some time afterwards. You see I wasn't on the passenger-cars, I was on the sand-cars, and did not have a chance to get around among the passenger cars so much.

Cross 22. How long after that did you see it on other cars?

A. Well, I couldn't exactly state how long, for I didn't keep any memorandum of the date or year.

Cross 23. Did you ever see a brake on the Camden & Amboy cars with two cross-levers underneath the car, called the Hodge brake?

(Objected to because it has nothing to do with the issues in this case.)

A. I couldn't say that I did. I have no recollection of seeing any.

Cross 24. Did you often have occasion to drill out passenger-cars there, at Bordentown, to get them out of the way of your sand-train?

A. Yes, sir; we had to drill them out pretty often.

Cross 25. Did you often drill out other passenger-cars as well as the Tyler?

A. Well, not so very often; once a week, and perhaps twice a week. We had to drill out more freight-cars than passenger-cars.

Cross 26. Did these other passenger-cars have on this same double brake?

A. Well, I don't recollect of their having them on.

Cross 27. How long did you continue brakeman on that dirt-train?

A. I continued onto it until the canal froze up—the Delaware and Raritan Canal. I then went on the freight-train from Amboy to Camden.

496 Cross 28. Can you swear that you saw these double brakes on any other car except the Tyler car before 1851 or 1852?

A. I don't know as I could. I saw them afterwards, but I didn't keep any memorandum of the number or the year.

his
JONAS + HAGAR.
mark.

Subscribed and sworn to before me this 15th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

WILLIAM COULTER, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. William Coulter; 47 years of age; reside at Jersey City, and am a railroad conductor on the New Jersey Railroad & Transportation Company.

Q. 2. How long have you been so employed?

A. Permanently since the 8th of October, 1845.

Q. 3. Do you know anything of the use of a double-acting brake on the cars of the Camden and Amboy Railroad about the years 1845 or 1846? If so, please state what you know, and the circumstances connected with such knowledge.

A. Well, they are very brief. In my applying the brake at one end of the car I found it did not hold. I let go, and some one was applying it on the other end, and I knew nothing about it. When he let go, the handle I had had hold of flew back and hit me on the hand. This was either in the fall of 1845 or the spring of 1846, I can't tell which.

497 Q. 4. Witness is here shown Exhibit A, and is asked to explain, if he can, by working the model, the circumstances alluded to in his last answer.

A. After I found the brake would not hold I stopped applying it, because the brakeman had his on, and I was not aware of it, and it flew back and hit me on the hand.

Q. 5. Were you at that time aware of the fact that this brake applied the power to both trucks at the same time, and from either end?

A. I was not.

Q. 6. Were you aware of the fact at any time thereafter that this brake did apply the power to both trucks at the same time?

A. Yes, sir.

Q. 7. What was the name or number of the car (if it had a name or number) with which this circumstance, named in your previous answer, is connected?

A. I know of no number; it was called the Tyler car.

Cross-examined by M'r Sayles:

Cross 8. You say, in your direct examination, that when you attempted to apply the brake on the Tyler car that it did not operate—that it didn't apply the brakes to the wheel, did you?

A. I did not, sir, from the fact that it was being applied on the other end of the car, which I found out afterwards.

Cross 9. Did you then find out that in case that brake was applied from both ends of the car at the same time that the brakemen would operate against each other, and so not apply the brake?

A. I never experimented with it. I judge so from the action of that brake at that time.

Cross 10. Did you often see this Tyler car, after this time you speak of, for a number of years thereafter.

A. I think as late as 1848, from the fact that on the first of April, 1848, I took charge of the Philadelphia train permanently, and it was occasionally put in the train as an extra car.

498 Cross 11. Do you recollect of seeing any other double-acting brake on the Camden and Amboy cars before 1852 or 1853?

A. Not to examine them. I don't recollect any.

Cross 12. At how early a date do you recollect seeing the brake, the same as was on the Tyler car, as you have stated, on any other of the Camden and Amboy cars?

A. I couldn't recollect distinctly about that. They kept applying them gradually after that, I think. I could not say for certain.

Cross 13. Do you distinctly recollect seeing it on any of their other cars before 1851 or 1852?

A. I couldn't say about that. I heve no recollection; but my impression is as early as 1850.

Cross 14. Do you recollect of seeing a double-acting brake on any of the Camden and Amboy cars with two cross levers under the car, called the Hodge brake?

A. I do not.

Cross 15. What kind of a brake is used on the passenger-cars of the New Jersey Railroad & Transportation Company?

A. Similar to the one on Exhibit A.

Cross 16. How long have such brakes been used on those cars?

A. That I couldn't tell.

Cross 17. At how early a date do you recollect seeing them on those cars?

A. It would be an indefinite answer, at any rate. I probably could not tell within two or three years, and then I might be mistaken at that.

Cross 18. Please state some year as near as you can.

A. I can safely go back to 1860, I think. It might be before that, and it might be later than that.

Cross 19. Can you swear positively that the double brakes which were on the passenger-cars of the New Jersey Railroad & Transportation Company, as you say you think about 1860, were at that time like the brake shown on Exhibit A?

A. No, I could not.

499 Cross 20. Can you say positively that the brakes on those cars

(Objected to because it has nothing to do with the issues in this case.)

A. I couldn't say that I did. I have no recollection of seeing any.

Cross 24. Did you often have occasion to drill out passenger-cars there, at Bordentown, to get them out of the way of your sand-train?

A. Yes, sir; we had to drill them out pretty often.

Cross 25. Did you often drill out other passenger-cars as well as the Tyler?

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Cross 26. Did these other passenger-cars have on this same double brake?

A. Well, I don't recollect of their having them on.

Cross 27. How long did you continue brakeman on that dirt-train?

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JONAS + HAGAR.
mark.

Subscribed and sworn to before me this 15th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

WILLIAM COULTER, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. William Coulter; 47 years of age; reside at Jersey City, and am a railroad conductor on the New Jersey Railroad & Transportation Company.

Q. 2. How long have you been so employed?

A. Permanently since the 8th of October, 1845.

Q. 3. Do you know anything of the use of a double-acting brake on the cars of the Camden and Amboy Railroad about the years 1845 or 1846? If so, please state what you know, and the circumstances connected with such knowledge.

A. Well, they are very brief. In my applying the brake at one end of the car I found it did not hold. I let go, and some one was applying it on the other end, and I knew nothing about it. When he let go, the handle I had had hold of flew back and hit me on the hand. This was either in the fall of 1845 or the spring of 1846, I can't tell which.

497 Q. 4. Witness is here shown Exhibit A, and is asked to explain, if he can, by working the model, the circumstances alluded to in his last answer.

A. After I found the brake would not hold I stopped applying it, because the brakeman had his on, and I was not aware of it, and it flew back and hit me on the hand.

Q. 5. Were you at that time aware of the fact that this brake applied the power to both trucks at the same time, and from either end?

A. I was not.

Q. 6. Were you aware of the fact at any time thereafter that this brake did apply the power to both trucks at the same time?

A. Yes, sir.

Q. 7. What was the name or number of the car (if it had a name or number) with which this circumstance, named in your previous answer, is connected?

A. I know of no number; it was called the Tyler car.

Cross-examined by M'r Sayles:

Cross 8. You say, in your direct examination, that when you attempted to apply the brake on the Tyler car that it did not operate—that it didn't apply the brakes to the wheel, did you?

A. I did not, sir, from the fact that it was being applied on the other end of the car, which I found out afterwards.

Cross 9. Did you then find out that in case that brake was applied from both ends of the car at the same time that the brakemen would operate against each other, and so not apply the brake?

A. I never experimented with it. I judge so from the action of that brake at that time.

Cross 10. Did you often see this Tyler car, after this time you speak of, for a number of years thereafter.

A. I think as late as 1848, from the fact that on the first of April, 1848, I took charge of the Philadelphia train permanently, and it was occasionally put in the train as an extra car.

498 Cross 11. Do you recollect of seeing any other double-acting brake on the Camden and Amboy cars before 1852 or 1853?

A. Not to examine them. I don't recollect any.

Cross 12. At how early a date do you recollect seeing the brake, the same as was on the Tyler car, as you have stated, on any other of the Camden and Amboy cars?

A. I couldn't recollect distinctly about that. They kept applying them gradually after that, I think. I could not say for certain.

Cross 13. Do you distinctly recollect seeing it on any of their other cars before 1851 or 1852?

A. I couldn't say about that. I heve no recollection; but my impression is as early as 1850.

Cross 14. Do you recollect of seeing a double-acting brake on any of the Camden and Amboy cars with two cross levers under the car, called the Hodge brake?

A. I do not.

Cross 15. What kind of a brake is used on the passenger-cars of the New Jersey Railroad & Transportation Company?

A. Similar to the one on Exhibit A.

Cross 16. How long have such brakes been used on those cars?

A. That I couldn't tell.

Cross 17. At how early a date do you recollect seeing them on those cars?

A. It would be an indefinite answer, at any rate. I probably could not tell within two or three years, and then I might be mistaken at that.

Cross 18. Please state some year as near as you can.

A. I can safely go back to 1860, I think. It might be before that, and it might be later than that.

Cross 19. Can you swear positively that the double brakes which were on the passenger-cars of the New Jersey Railroad & Transportation Company, as you say you think about 1860, were at that time like the brake shown on Exhibit A?

A. No, I could not.

499 Cross 20. Can you say positively that the brakes on those cars

at that time did not have two cross levers under the car, instead of one, like Exhibit A?

A. I could not say anything about it.

Direct resumed:

Q. 21. Is there any doubt in your mind as to whether the circumstance alluded to in your direct examination connected with the Tyler car took place before 1847?

A. Not in the least.

W. COULTER.

Subscribed and sworn to before me this 15th day of August, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to 12 m., the 16th instant.

FRIDAY, *August* 16, 1867.

Present, counsel for the respective parties.

Adjourned by the examiner to the 3d day of September, 1867, at 12 m.

TUESDAY, *September 3d*, 1867.

Present, counsel as before.

JOHN H. HILLMAN, called and sworn as a witness on the part of defendant, deposes and says:

500 Q. 1. What is your name, age, residence, and occupation?

A. John H. Hillman; 52 years of age; reside at Trenton, New Jersey, and am at present in the lumbering business, but have served my time at wheelwright business and coach work.

Q. 2. Do you know the circumstance of President Tyler's coming over the Camden and Amboy road on a tour north; if so, what do you know, and how do you fix the time?

A. I do know of his coming on a tour north. I remember the circumstance, and fix the date by the daily State Gazette, published by Sherman & Hanon. I took the paper at the time. The day he passed through Trenton was June 10, 1843.

Q. 3. Have you had occasion of late to refer to said paper; if so, where did you obtain it, and of whom; and is the volume containing said paper in your possession?

(Objected to.)

A. I have. I obtained it from the office of said paper, and from the present editor and proprietor, Jonathan Vannote. The volume of said paper is in my possession.

Q. 4. Witness is here requested to refer to the volume of said paper, and state the date in which a record is made of the tour of the President above referred to?

(Objected to.)

A. It is on Monday, June 12, 1843.

Defendant now offers in evidence a copy of an editorial taken from the said weekly State Gazette, volume 4, 1843, as follows:

(Objected to.)

501 State Gazette, Trenton, Monday, June 12, 1843.

For President,

HENRY CLAY.

THE PRESIDENT IN NEW-JERSEY.

On Saturday afternoon President Tyler and suite entered the State of New Jersey, on his way to Bunker Hill. On reaching the Jersey shore at Camden, the President was received with three cheers, and being escorted to a grove at a short distance, was addressed by Captain Mickle on behalf of the city of Camden. The President replied, complimenting the Jersey Blues on their patriotism. (An elegant bouquet was here presented to the President, which was committed to the charge of the United States marshal and his deputies, who carried it as they accompanied the President to Princeton.) In a few minutes the company were seated in the cars of the Camden and Amboy Railroad, and the train started for Burlington. At the upper end of Camden a large assemblage of ladies, ranged along the road, saluted the President with waving handkerchiefs.

On arriving at Burlington the company left the cars, and proceeded in procession to the house of William R. Allen, esq., mayor, where the President was waited on by many of the citizens. After a short stay the company again took seats, and the train proceeded to Bordentown. On passing White Hill a salute was fired. At Bordentown the company proceeded to Kester's, where the President was addressed by the Rev. M'r Lathrop, and made a suitable reply.

In a short time the company again started, and soon arrived at Trenton. He was here received with cheers, the several bells of the city ringing. The committee of the common council, who had proceeded to Philadelphia, escorted the President from the cars, where D'r John McKelway, chairman of the committee of citizens, introduced him to the mayor, Charles Burrows, esq. The mayor tended to him the
502 hospitalities of the city in a neat speech, to which the President
made a handsome reply. A salute of artillery was fired from a field adjoining, and the company again took the cars for Princeton, where, we understand, he remained until this morning, and then proceeded to New Brunswick.

Q. 5. Do you know anything about a car called the John Tyler, in use on the Camden and Amboy road; and, if so, what do you know about it?

A. I know there was such a car in use for some ten years, and I remember it from the spring of 1844. I remember it from its having "J. Tyler" in gilt letters on the inside. I have rode in the car myself.

Q. 6. Do you know what kind of a brake was on said Tyler car?

A. Merely from the brakeman speaking of their having a double brake on the car.

Q. 7. Do you know anything of the use of double brakes on the Camden and Amboy road of your own knowledge? If so, please state the circumstance, if any, connected with such knowledge.

A. In May, 1845, I was coming from Philadelphia to Trenton. I was asked to help put on the brakes by the conductor. I took hold of the crank of the brake, and felt another person drawing the brake at the other end of the car, or, in other words, the brakes were put on from the other end of the car, and I noticed when the train started, and the brakes came off, that the crank I had hold of flew around of itself.

JOHN H. HILLMAN.

Subscribed and sworn to before me this 3d September, 1867.

R. E. STILWELL,
Examiner, &c.

503 JAMES SEEDS, called and sworn as a witness on the part of the defendants, deposes and says:

Q. 1. What is you name, age, residence, and occupation?

James Seeds; about 47 years of age; reside at Trenton, New Jersey, and am a carpenter.

Q. 2. Were you ever in the employ of the Camden and Amboy Company; if so, when were you so employed, and in what capacities?

A. Yes, sir; I did used to work for the Camden and Amboy Company, in the freight-house, about 1841 or 1842, at Trenton. In about a year or so after that I took the draw where the road crosses the canal at Trenton. When I was there, and when I was at the freight-house both, I was frequently called away as an extra brakeman. I was an extra brakeman about two years before I became a pemanent brakeman. I followed the brake some two years. I can't tell exactly, and went to firing. I fired a locomotive then about two years. I then left that and took the job of night watch of Trenton depot, and, I think, that is about the last work I done for the company.

Q. 3. While brakeman for said company were you knowing to the use on the cars of that road of double or connected brakes; if so, what do you know about it, and what circumstance, if any, fixes the thing in your mind?

A. I was. The first that I recollect of it was on the Tyler car. It was on the Tyler car when it first came on Quinton's line, as we called it, or the way line from Philadelphia to Trenton. What makes mere member the Tyler car is that it had a water-closet on it, and we used it as a lady's car. There was another thing that brought the Tyler car to my mind; it was rather a singular car; it hadn't three seats in it alike.

Q. 4. About what year, as nearly as you can recollect, did the car come on to that line?

A. 1844.

Q. 5. Do you know of this double brake being in use upon any
504 other car at any time when you were brakeman; if so, what circumstance, if any, fixes the brake in your mind?

A. In about 1845 or 1846 it was put on a crate-car on Quinton's line. There being only one brakeman on the line, it was put there to have more effect upon the wheels than a single brake would have. On that connected brake I could chock (stop) eight pair of wheels; I mean four pair of wheels, two front and two back.

Q. 6. Have you ever seen the wheels in both trucks slide upon the rail in the application of this connected brake when applied by yourself or by another?

A. I have in both cases.

Q. 7. While you were brakeman did you know Joseph Cox; if so, what do you know about him, and is he still living?

A. I knew Joseph Cox; he was an engineer on the Trenton way line. I have broke and fired for him extra on his train. He was killed between Bristol and Nachamany bridge.

Q. 8. Did what you have stated in reference to the double or connected brake take place before or after the death of Joseph Cox?

A. I think part before and part afterwards.

Q. 9. What part took place before?

A. I am not certain whether we had the double brake on Josie's crate-car before or afterwards, made me speak that way.

Cross-examined by M'r Cozzens:

Cross 10. Where you brakeman on any train in which the Tyler car ran?

A. Yes, sir.

Cross 11. What train?

A. The way-train between Trenton and Philadelphia.

Cross 12. In what years did the Tyler car run on that train?

A. The first I recollect of it was in 1844, and, I think, it was there two or three years after that.

505 Cross 13. Do you mean all the time for two or three years after 1844?

A. No, sir; I can't say it was there all the time.

Cross 14. How much of the time was it there, according to your best recollection, for two or three years after 1844?

A. I don't think I would be out of the way in saying half of the time; I can't say certain.

Cross 15. Was it in that train all the time your were brakeman on the train?

A. All the time I was regular brakeman it was; but when I was extra brakeman I was on various lines.

Cross 16. How long were you regular brakeman?

A. I couldn't say exactly; somewhere between two and three years.

Cross 17. Was these two or three years the next two or three years following 1844, that you were regular brakeman?

A. I thing there was a year between, as near as I can recollect now.

Cross 18. Then the two or three years would commence in 1845, would they?

A. To the best of my knowledge.

Cross 19. About what time in 1845, to the best of your recollection, did you so commence to be regular brakeman?

A. I don't think it was much before the middle of the year, as near as I can recollect; it was about the middle of the year, as near as I can tell.

Cross 20. You say that the first that you recollect of a double brake, it was on the Tyler car. Now, is it a matter of positive recollection with you that the Tyler car had a double brake on it in the year 1844?

A. Yes, sir.

Cross 21. What makes you recollect it positively in that year?

A. From using it daily whenever it was on our line.

Cross 22. What line do you mean by "our line"?

A. The way line between Philadelphia and Trenton.

506 Cross 23. You mean, do you not, that you recollect the Tyler car from its peculiarities of construction as differing from other cars on the road?

A. Yes, sir.

Cross 24. You remember, do you not, that during many of the last years you recollect the Tyler car it had a double brake?

A. Yes, sir; a connected brake, I used to call it, which is one and the same thing, I suppose.

Cross 25. You feel positive, I suppose, that there was such a car as the Tyler car on the Camden and Amboy road in the years 1843, 1844, 1845, 1846, and 1847, as well as later, having certain peculiarities of construction which distinguished it from other cars on the road?

(Objected to, as the witness has not stated that he has any knowledge of the Tyler car in 1843.)

A. I am positive between 1844 and 1847.

Cross 26. If anybody, at any time within the past year, had asked you if you remembered the Tyler car in the years 1844, 1845, 1846, and 1847, would your memory of it been clear enough to enable you to say at once that you did remember it in those years?

A. Yes, sir.

Cross 27. It is a well-known fact, is it not, that there was a Tyler car on that road in those years?

A. I know it, sir, and most all the brakemen who had the care of it know it.

Cross 28. Wasn't it well known on the road by others besides the brakemen?

A. I suppose so, sir; I can't say for certain.

Cross 29. When lately, during this present year, 1867, has anybody talked to you on the subject of the Tyler car or double brakes on the Camden and Amboy road?

A. I have been asked what I knew about the Tyler car within two or three months.

Cross 30. Who asked you?

A. M'r Edwin Lockwood.

507 Cross 31. In what words did he ask you what you knew about it, and what conversation took place? State the whole of it.

A. He asked me if I recollected the Tyler car, and I told him I did. He asked me if I recollected what kind of a brake it had on it. I told him it had a double connecting brake on it. I spoke of its having a water-closet; I also spoke about the seats inside, that there was no three of them alike. That is all I recollect telling him.

Cross 32. Did he say anything more to you than you have stated; if so, what?

A. No, sir; I don't recollect his saying anything more to me.

Cross 33. Didn't he say anything to you about there being a lawsuit, or a question about double brakes?

A. No, sir; he merely asked me the questions I have told you.

Cross 34. Did he tell you that perhaps you would be called upon to be a witness about the John Tyler?

A. He did not tell me so directly; I found out afterwards from M'r Hillman that he wanted me as a witness. I mean by he, M'r Lockwood.

Cross 35. You say Lockwood did not tell you directly. Did he say anything at all about it indirectly?

A. All he said to me was, do you remember the Tyler car, and he asked me if I knew about it.

Cross 36. How did you mean that he did not tell you so directly then?

A. I don't think that he ever told me that he wanted me as a witness at all; I mean that I got it through others.

Cross 37. Is this brief conversation that you have detailed between yourself and Lockwood the only conversation you have had with anybody during the present year about the John Tyler or its brakes?

A. No, sir; it is the only one I had with M'r Lockwood.

Cross 38. With whom else have you had a conversation on the subject, and when?

A. M'r John Hillman.

Cross 39. With anybody else?

A. I don't recollect anybody else at present.

508 Cross 40. What was the conversation between you and Hillman?

A. He asked me about the same questions as Lockwood did, as near as I can tell. He asked me if I knew about the Tyler car. I told him the same as I have told you heretofore about it; that it had a water-closet on it, and a double brake on it, and that it had different kinds of seats inside, and he guessed he would want me to go to New York. I can't recollect exactly the words he used. He told me that he thought there was a lawsuit, and he would want me as a witness. I inferred that it was about the Tyler car, as we had been talking about that.

Cross 41. Are these two short conversations the only ones you have had with any one this year about the Tyler car and its brakes?

A. To the best of my knowledge, I believe they are.

Cross 42. Have you any knowledge of there being at any time a double brake on the Camden and Amboy road called the Hodge brake, having two cross-levers under the car-body?

A. I don't recollect such a brake.

Cross 43. Have you any recollection of there being at any time a double brake on the Camden and Amboy road called the Stevens brake, having four upright levers under the car-bodies, and no cross-levers?

A. I can't say that I do.

Cross 44. Have you any recollection of there being at any time on the Camden and Amboy road a brake called the McLoughlin brake, which was worked by car-bumpers?

A. I don't recollect any.

Cross 45. While you were in the employ of the Camden and Amboy road, were you in the habit of noticing in a general way the cars on the road from time to time, so that you knew how they were constructed?

A. Well, I never took any particular notice, but in a general way, I did.

Cross 46. Did you, while in such employ, from time to time, notice the brakes on the cars in a general way?

A. Yes, sir.

509 Cross 47. When did you leave the employ of the Camden and Amboy Company?

A. Well, sir, I don't know that I can come within a year or two, but somewhere along 1855 or 1856, I should think.

JAMES SEEDS.

Subscribed and sworn to before me, this 3d September, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to half past ten a. m., the 4th inst.

WEDNESDAY, *September 4th*, 1867.

Present, counsel as before.

Adjourned to the 5th inst., at eleven a. m.

THURSDAY, *September 5th*, 1867.

Present, counsel as before.

JOSEPH CAPNER, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Joseph Capner; 45 years of age; reside at South Amboy, New Jersey, and am a miller.

Q. 2. Were you ever in the employ of the Camden and Amboy Railroad; if so, when did you commence, and how long did you continue, and what did you do?

510 A. I was. I commenced with them on the 3d day of August, 1847, and continued with them sixteen years. I went on the brake for the first six months, and after that as conductor, on the way freight and passenger; some call it the Trenton line, or Capner's line, from the fact that I run it.

Q. 3. While brakeman did you know anything of the use of a double brake on that road; if so, what circumstance brings the thing to your mind?

A. They had them on the mail-cars, and I often used to wish that they would put them on mine. I always looked after my own brake.

Q. 4. What further knowledge have you of the use of this brake, at any other time after you were brakeman?

(Objected to.)

A. In 1848 and 1849, at the time of the starvation in Ireland, we got some new cars, and one or two had them on.

Q. 5. When you came on the road in 1847, did you know thereafter, and during that year, of a car called the John Tyler; if so, do you know what brake was on it? and, if so, describe the same.

A. Well, I knew the car very well, and there was a connected or double brake with a cross-lever under the bottom of the car on it; the connecting lever had four rods and there was a crank on both ends, and when there was a crank on one end they had three rods, and they all acted on both brakes.

Q. 6. Do you mean to say that when the brake was operated from one end of the car only, that the brakes were applied to both trucks?

A. Yes, sir.

Q. 7. Had there been a windlass and connecting-rod put on the other end, would the brake be applied as stated in your last answer?

A. Just as well from one end as the other.

Q. 8. Witness is now shown Exhibit A, and is asked what it represents.

A. A brake on the bottom of the car, and what we call a connected brake, and is such as I have described.

Q. 9. When you first became acquainted with the cars on the Amboy road was there a paw' and ratchet applied to the brake staff or windlass, by which the power was applied to the brakes; if not, was it afterwards so applied?

A. There was none at that time, but there was afterwards. The paw' and ratchet was to hold the brake on. The ratchet held the power which we used to hold with the hand.

Cross-examined by M'r Cozzens:

Cross 10. At the time you say you knew of the Tyler car, in 1847, was there a good deal of talk among the hands on the road about that car?

A. Yes; it was something new, and, of course, there was some excitement.

Cross 11. Do you mean that it was something new, and consequently created excitement?

A. The brake was something new, and, I suppose, excitement was caused by it. The men would say to one another, do you see that brake on the Tyler car?

Cross 12. The men talked about it considerably, did they not?

A. Yes, sir.

Cross 13. Did you ever know of any brake used on the Camden and Amboy road, having two cross-levers under the body instead of one, and styled the Hodge brake?

A. I did after that.

Cross 14. When first?

(Objected to as it has nothing to do with this controversy.)

512 A. It was about a year or a year and a half after; it may be longer. They were cars built by another company; a car-building company at Trenton.

Cross 15. Were those the first cars on which the Hodge brake was used on the Camden and Amboy road?

A. I rather think not; I don't know.

Cross 16. Can you describe the construction of this Hodge brake?

(Objected to for the reason that witness is not introduced as an expert.)

A. I never knew what name they called it; there was links hanging down, and levers on the links; a single rod from one lever to the other in the centre; then the rods were coupled on these the same as in the other connected brakes.

JOSEPH CAPNER.

Subscribed and sworn to before me this 5th September, 1867.

R. E. STILWELL,
Examiner, &c.

JAMES C. HILLMAN, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. James C. Hillman; 37 years of age; reside at Trenton, New Jersey, and am in the coal business.

Q. 2. Do you know anything of the use of brakes on a car or cars on the Camden and Amboy road when you were a boy; and, if so, what circumstance fixes the matter in your mind? Please state fully, 513 and tell all you know about it, and what car the brake was on, if you know, and also state how you fix the date or time of seeing said brake?

A. I know of the use of brakes on the Camden and Amboy road; it was in 1845. The way that I fix the date is that I was fourteen years old on the 10th day of August. I had my choice either to go to school or to work at the end of my vacation in August. I went to work. Now it was before that I saw this car. It was what they called the Tyler car. Myself and several other boys made a practice of being around the railroad when we were out of school. We heard the new engine (the Ben Franklin) and the Tyler car were at the old depot in Trenton, and at the lower tank. We boys got around the car, went inside and looked at it, came out and commenced fooling with the brakes, and in the operation of twisting them on and off at each end I was struck in the side with the brake handle, and it gave me a pretty severe lick. My inquiry was then who done it, and what done it, and the boy told me on the other end that he pulled the brake out of my hand. I couldn't see how that could be, because it was different from any brake I ever saw on a car. We then got down and looked at it underneath, and we found out that by putting the brake on at either end, that we put the brake on all the wheels.

Q. 3. Do you recollect whether there was a paw'and a ratchet on the brake-staff to hold the power when you wound up the crank?

A. No, sir; there was none on.

Cross-examined by M'r Cozzens:

Cross 4. Are you a brother of John H. Hillman, who has been examined in this matter?

A. Yes, sir.

Cross 5. What are the names of any of the others of the boys who you say were with you on the occasion you have referred to?

514 A. Joseph Jeffries and his brother, we called him Gill; he was killed at Boiling Springs; Henry Ashmore, and Joseph Justice, and Thomas Clayton, and others, whom I do not remember.

Cross 6. Where are Jeffries, Ashmore, Justice, and Clayton now?

A. I don't know where Jeffries is; Ashmore is in Easton, or was the last I heard of him; Justice went to Philadelphia, to learn the bricklaying with George Creel, near Seventh and Cherry streets. I don't know what ever became of Clayton.

Cross 7. Do you sell coal to the Camden and Amboy Railroad Company?

A. No, sir; in no way, directly or indirectly.

Cross 8. At the time you speak of in 1845 was there much talk about the Tyler car being different from other cars on the road?

A. It was considered a better-finished car, and a different pattern.

Cross 9. At that time was the car a good deal noticed, and a good deal talked about?

A. Yes, sir; with my associates it was.

Cross 10. Did you hear it talked about considerably among the hands on the road?

A. Yes, sir; and the engineer and fireman talked about it, brakeman, and all hands on the road.

Cross 11. Had it been recently fitted up, or refitted, at the time mentioned by you in your direct examination?

A. I can't answer that. It was in good condition; it looked new, clean, and nice.

Cross 12. After this time you have spoken of, did you ever again notice the brakes on the Tyler car?

A. Yes, sir.

Cross 13. Did you ever again get under the car to see how the brakes was arranged?

A. No, sir; I don't know that I ever did.

JAMES C. HILLMAN.

Subscribed and sworn to before me this 5th September, 1867.

R. E. STILWELL,
Examiner, &c.

515 ASHER PANCOAST, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Asher Pancoast; 52 years of age; reside at Camden, New Jersey, and am a locomotive engineer, and in the employ of the Delaware and Raritan Bay Company.

Q. 2. Were you ever in the employ of the Camden and Amboy Railroad Company? If so, when, and how long?

A. I went with them in the latter end of 1839, and left them in 1861.

Q. 3. What did you do in the year 1843?

A. I was a brakeman.

Q. 4. During the year 1843, did you know of the use of a double brake on that road? If so, what do you know about it, and what circumstance fixes the thing in your mind?

A. I did. In June, 1843, John Tyler was coming through the State, and I, being an extra man, was called on to be a brakeman. The afternoon before we started for Camden John Banney and myself were standing by the side of the car which conveyed the President. Benjamin H. Harber and Charles Vandergrift were at work on the undergearing of the car. John Banney said to me that I must ride behind the President. Mr Harber said that there was no use of more than one riding behind on that brake, for one man was as good as two. We got into a little kind of a contradiction there. He told us to get up on the car and try it, which we did. We found it was as he said. One was on each end of the car, and we both put the brake on. By that means we found Mr Harber was right in what he said. In the mean time Captain Shipman, the superintendent of the road, came along. He says, "Here you are talking again, as usual; more talk than work. I wish you would work more and talk less."

Q. 5. Please give some description of the brake, as then applied to this car referred to in your last answer.

516 A. The brake was connected with a rod from the centre of the truck with a bolt and a key to a cross-lever. I think it had four connecting rods—two to each lever—and the main rod went from one to the other in the centre.

Q. 6. How were the connecting rods attached to this cross-lever?

A. They were attached to the end of it—some by a hook and some with an eye and bolt; I can't say exactly about it.

Q. 7. Did this cross-lever apply the power of the brakeman to both trucks?

(Objected to.)

A. Yes, sir.

Q. 8. Witness is now shown Exhibit A, and asks what it represents.

(Objected to.)

A. It represents the brake, as near as I recollect; but I cannot recollect exactly. The cross-lever was connected to the bottom of the car, as in the model. One end of the connecting rod was connected by a pin and key. One of the rods on one end had two or three links of a chain, and hooked on to the cross-lever.

Q. 9. Are you sure that one of the rods connected with the cross-lever had two or three links in it, or do you testify only from recollection?

(Objected to.)

A. From recollection, as near as I can tell. It is a good while to remember.

Q. 10. Who was brakeman on the car which took John Tyler over the road, or, as you say, through the State?

A. William Crim and myself.

Q. 11. Who operated the brake on the car in which the President rode?

517 A. I did.

Q. 12. Do you know of your own knowledge that there was a double brake on that car?

(Objected to.)

A. Yes, sir.

Q. 13. Do you know anything about excursion trains being run on the Camden and Amboy road? If so, in what years were they run?

A. They were run in 1843 and 1845. I don't remember of any being run in 1844; I think there were none in 1844.

Q. 14. Were you at any time in 1845 a passenger on one of those excursion trains? If so, what circumstance occurred connected with the brakes while on said train?

A. Yes, sir; I was a passenger from Camden to Bordentown. About six miles from Bordentown something got wrong under the cars—under the train. We stopped, and the brake-rod was down, dragging on the ground. The engineer came to see what was the matter, and went to the engine and got his tools and bolt and put the rod up.

Q. 15. To what was this rod which fell down connected?

A. To the cross-lever.

Q. 16. State, if you know, who was engineer, who conductor, and who brakeman of that train on which you were riding.

A. Charles Yundt was engineer, John Holland was fireman, and Andrew Heath was conductor, and William Crim and Joseph Harber were brakemen.

Q. 17. Do you know anything about the use of this cross-lever brake on any other cars on that road than the one which carried the President? If so, state what you know.

A. There was a baggage-car made for the five o'clock mail line from Philadelphia to New York; they put eight wheels under that, and that had a cross-lever brake on.

Q. 18. About what time was this car put upon the road?

A. In 1844—about a year afterwards.

Adjourned to the 6th inst., at 11 a. m.

518 **Friday**, *September 6th*, 1867.

Present, counsel as before.

Q. 19. Is there any other circumstance than the one of President Tyler's passing over the road which enables you to fix the date of said double brake on the Tyler car in June, 1843? If so, please state the same.

A. Family affairs. I had a son born July 26, that same year; my wife was in delicate health. I was living in a house at Bordentown, Mansfield Township, and a man, Job Hooper, lived in part of the house with me. He said if I went on the brake he would attend to matters at home. I went down as extra brakeman on the Tyler car when the President was taken over the road.

Q. 20. In answer to the 5th direct interrogatory, in which you are asked to give some description of the brake in question, you say, "The brake was connected with a rod in the centre of the truck, with a bolt and key to a cross-lever." Can you not make the statement a little clearer by using some other words?

(Objected to.)

A. I want to say that the rod was connected with a lever from the centre of the truck or brake-beam to the cross-bar connected to the centre of the car.

Q. You then say, "I think it had four connecting rods, two to each lever, and the main rod run from one to the other in the centre." Is that what you wish to say on the further description of this brake, or do you wish to modify your statement?

(Objected to.)

A. Yes, sir; that is what I wish to say. I do not wish to modify the statement.

519 Q. 22. Do you mean to say that there were two rods to each lever, that is connected to each lever?

(Objected to.)

A. No, sir; I mean to say there were two rods at each end of the cross-lever.

Cross-examined by M'r Cozzens:

Cross 23. How do you know that John Tyler came through the State in June, 1843?

A. I saw him.

Cross 24. How do you know that it was in June, 1843?

A. I had a son born on the 26th day of July.

Cross 25. What has that to do with it?

A. When I was going away from home my wife was in delicate health and she did not want me to go, and I got a man to stay in my place.

Cross 26. Well, what relation has all that to the time when Tyler went through the State?

A. By my going to work on the railroad, and I know what I was doing at that time.

Cross 27. At what time?

A. In 1843.

Cross 28. At what time in 1843?

A. In June, 1843; I disremember the day of the month.

Cross 29. You say by my going to work on the railroad; going to work on the railroad, when?

A. I went to work in 1839 on the railroad.

Cross 30. How does your knowing what you were doing in June, 1843, and your going to work on the railroad in 1839 enable you to tell when Tyler went through the State?

A. By my family affairs; when my son was born on the 26th day of July.

Cross 31. You say, "when you were going away from home;" where were you going?

520 A. I was going to Camden.

Cross 32. Where was your home?

A. At Bordentown.

Cross 33. How far is it from Bordentown to Camden?

A. Twenty-six miles, or thereabouts.

Cross 34. You say you got a man to stay in your place; where did you get him to stay?

A. At my house, or at his own house; we both lived in the same house together.

Cross 35. How long was your wife in delicate health at that time?

A. You might say the whole nine months.

Cross 36. During that time did she frequently object to your going away?

A. Yes, sir.

Cross 37. And when you went did you frequently get a man to stay in your place?

A. Well, I don't know as I did until the latter part of the time, as I did not have much occasion.

Cross 38. During the latter part of the time did you frequently get a man to stay in your place when you went away?

A. I had no occasion to get a man all the time, because the man lived in the house with me all the time.

Cross 39. This man you got to stay in your place at the time referred to lived in the house with you, didn't he?

A. Yes, sir.

Cross 40. Then did you not frequently during the latter part of the time your wife was sick get that same man to stay in your place when you were going away?

A. I had no occasion; any one who knows anything of human nature knows that there are times when one is needed more than at others.

Cross 41. Then will you say that at no other time than the one referred to during the whole period that your wife was in delicate health at this time you got this man to stay in your place when you went away?

A. I don't recollect, sir.

Cross 42. Is it not possible that there might have been some other time?

521 A. Well, there might; I don't recollect it; it is a good while ago.

Cross 43. When you went away at these times what did you go away to do?

A. Sometimes to brake and sometimes to fire locomotive.

Cross 44. How many times, as near as you can state, did you go away to brake while your wife was sick at this date?

A. I don't recollect.

Cross 45. State as nearly as you can?

A. I couldn't state; I was braking for a living, and doing most anything I could get to do.

Cross 46. Did you go away twenty times?

A. I couldn't say.

Cross 47. Did you go away ten times?

A. I couldn't say anything about it, how many times I went away.

Cross 48. Do you mean to say that you fix the time that Tyler went through the State by your going away from home while your wife was sick, and by her not wanting you to go?

A. Yes, sir.

Cross 49. Have you any other means of fixing it?

A. No, sir.

Cross 50. Have you had children other than the son referred to?

A. My wife had one before this one; she had four altogether.

Cross 51. When were the other two born?

A. One was born in 1850 and the other in 1859.

Cross 52. Was the one born in 1850 a son?

A. No, sir; a girl.

Cross 53. Where were you living in 1850?

A. At Bordentown.

Cross 54. Was this man you referred to still living in your house at that time?

A. No, sir.

522 Cross 55. What were Harber and Vandergrift doing to the under-gearing of the car which you say the President was conveyed in?

A. I don't know, sir.

Cross 56. Did you see such a brake as you say was on the Tyler car on any other car in 1843?

A. I don't recollect about 1843, but in 1844 there was one.

Cross 57. You say in your fifth direct answer that "the brake was connected from the centre of the truck to the cross-lever, and had four connecting rods, and that the main-rod went from one to the other through the centre." Do you mean that this cross-lever had a connecting rod running to the centre of the truck and another connecting rod running off towards and connected to the windlass staff?

A. I mean it as I said it before, four rods connected to that cross-beam, and one rod from the centre of the truck or brake-beam.

Cross 58. What did you mean when you said in your fifth direct answer, "four connecting rods, two to each lever, and the main rod went from one to the other through the centre?"

A. I mean to say that there was two rods at each end of the cross-beam, and one rod goes through the centre of the brake-beam and one to the lever on the brake-beam.

Cross 59. What do you mean by the main rod you spoke of?

A. The one that connects the two brake-beams on the truck.

Cross 60. You said in your fifth direct answer "four connecting rods, two to each lever." What do you mean by each lever?

A. I said four connecting rods to each end of the cross-beam.

Cross 61. Are you sure of that?

A. To the best of my knowledge.

Cross 62. Look at your 5th direct answer and see if you said so, and state how you find it?

A. That is what I said if you understand it; four connecting rods; two at each end of the cross-beam.

523 Cross 63. Is this the best description you can give of that brake?

A. Yes, sir.

Cross 64. Did Crim help you operate the brakes on the car the President rode in?

A. He operated that himself; I rode in the gig-top on the tender.

Cross 65. You mean that he operated it the day the President went on the road, do you?

A. Yes, sir.

Cross 66. How do you know that it was in 1844 that the baggage-car that you have referred had a double brake on it?

A. It was on the mail line, and I had the braking of it.

Cross 67. After you first commenced to be brakeman, how long did you continue to be?

A. Until the first of 1845; the latter end of January, I think.

Cross 68. Were you never brakeman after that?

A. No, sir.

Cross 69. Can you give any further or other description of the brake on this baggage-car than you have given of the brake on the other car?

A. No, sir; I know it was a double brake, and that is all I know of it; there was a brake for either end of it; I could ride towards Jersey City on one end, and towards Camden on the other end.

Cross 70. Do you remember a brake on the Camden and Amboy road called the Hodge brake, having two cross-levers under the bottom of the car?

(Objected to for the reason before stated.)

A. I can't say that I do; I recollect such a man as being around.

Cross 71. When was he around, as near as you can state?

A. I couldn't say; I couldn't get anywhere near it; I don't know anything about it.

524 Cross 72. Was it while you were firing?

A. I couldn't say whether it was or not.

Cross 73. Was it before 1855?

A. I could not say whether it was or not; I don't know anything about it.

Cross 74. What was he around for?

your wife was sick get that same man to stay in your place when you were going away?

A. I had no occasion; any one who knows anything of human nature knows that there are times when one is needed more than at others.

Cross 41. Then will you say that at no other time than the one referred to during the whole period that your wife was in delicate health at this time you got this man to stay in your place when you went away?

A. I don't recollect, sir.

Cross 42. Is it not possible that there might have been some other time?

521 A. Well, there might; I don't recollect it; it is a good while ago.

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A. Sometimes to brake and sometimes to fire locomotive.

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A. I don't recollect.

Cross 45. State as nearly as you can?

A. I couldn't state; I was braking for a living, and doing most anything I could get to do.

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A. I couldn't say anything about it, how many times I went away.

Cross 48. Do you mean to say that you fix the time that Tyler went through the State by your going away from home while your wife was sick, and by her not wanting you to go?

A. Yes, sir.

Cross 49. Have you any other means of fixing it?

A. No, sir.

Cross 50. Have you had children other than the son referred to?

A. My wife had one before this one; she had four altogether.

Cross 51. When were the other two born?

A. One was born in 1850 and the other in 1859.

Cross 52. Was the one born in 1850 a son?

A. No, sir; a girl.

Cross 53. Where were you living in 1850?

A. At Bordentown.

Cross 54. Was this man you referred to still living in your house at that time?

A. No, sir.

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A. I don't recollect about 1843, but in 1844 there was one.

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A. I mean it as I said it before, four rods connected to that cross-beam, and one rod from the centre of the truck or brake-beam.

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Cross 62. Look at your 5th direct answer and see if you said so, and state how you find it?

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523 Cross 63. Is this the best description you can give of that brake?

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Cross 64. Did Crim help you operate the brakes on the car the President rode in?

A. He operated that himself; I rode in the gig-top on the tender.

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A. It was on the mail line, and I had the braking of it.

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Cross 68. Were you never brakeman after that?

A. No, sir.

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A. No, sir; I know it was a double brake, and that is all I know of it; there was a brake for either end of it; I could ride towards Jersey City on one end, and towards Camden on the other end.

Cross 70. Do you remember a brake on the Camden and Amboy road called the Hodge brake, having two cross-levers under the bottom of the car?

(Objected to for the reason before stated.)

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Cross 71. When was he around, as near as you can state?

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524 Cross 72. Was it while you were firing?

A. I couldn't say whether it was or not.

Cross 73. Was it before 1855?

A. I could not say whether it was or not; I don't know anything about it.

Cross 74. What was he around for?

(Objected to for the reason that witness is not supposed to know other men's business.)

A. I don't know.

Cross 75. Have you any knowledge of a brake on the Camden and Amboy Railroad called the Stevens brake, and having four upright levers under the car body?

(Objected to as irrelevant.)

A. No, sir.

Cross 76. Have you any knowledge of a brake on the Camden and Amboy road called the McLoughlin brake, which was operated by the bumpers of the cars?

(Objected to for the same reason.)

A. Yes, sir.

Cross 77. When did you know of this brake?

A. I can't say.

Cross 78. Can't you give us any idea of the time?

A. I used it some ten years ago.

Cross 79. Upon how many cars was it placed?

A. On one whole train, called the Amboy line; the regular mail train from Amboy to Philadelphia.

Cross 80. How many cars were there usually in this train?

A. Five to six and seven.

Cross 81. About how long did it continue on this train?

A. I couldn't say; a year or more.

525 Cross 82. Did that train run every day except Sundays?

A. Yes, sir.

Direct resumed by M'r Whipple:

Q. 83. You say in answer to eleventh direct interrogatory, the question and answer being as follows: "Who operated the brake on the car on which the President rode?" You say, "I did." Are you or are you not mistaken in saying that William Crim operated it and that you rode in the gig-top?

A. We were both one, you might say; my place was in the gig-top, and his also; he was there sometimes, and I was there sometimes, when I was forward.

Q. 84. Are you quite sure that William Crim was brakeman on that train which took the President through the State?

A. Yes, sir; to the best of my knowledge he was.

Q. 85. May you not have confounded his being a brakeman on an excursion train in 1845 with his being on the President's train in 1843?

A. No, sir; I was not a brakeman on the excursion train.

ASHER PANCOAST.

Subscribed and sworn to before me this 6th September, 1867.

R. E. STILWELL,
Examiner, &c.

Henry H. Disbrow, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

526 A. Henry A. Disbrow; 60 years of age; reside in South Amboy, and am a carpenter.

Q. 2. Have you been in the employ of the Camden and Amboy Railroad Company; if so, from what time to what time, and what did you do while so employed?

A. I have; I went to work for them in 1845 on the road; I worke on the road till 1847, and then went into the shop, and worked in the shop till 1855, and then left the employ of the company.

Q. 3. While at work in the shop, did you have occasion to repair brakes; if so, what kind of brake was it; what did you do in the way of repairing it?

A. I did; one in particular, I had occasion to repair, was one that worked from the centre of the car, which operated on both trucks at the same time; one of the rods connecting with the cross-lever was broken, and I had to take it down and take it to the blacksmith's shop and have it mended, and take it back again.

Q. 4. At what time, that is, what year did you repair this brake, and how do you fix the time?

A. Well, sir, it was in 1848, and the reason I know, my wife was confined at that time, and my eldest son came after me, and I went for the doctor; she had a boy, and from his age I know the time, that it was the 15th day of March, 1848.

Q. 5. Please state whether the rod which you had mended was one that connected the cross lever with the lever in the truck, or with the windlass of the car?

A. It connected with the one in the truck.

Q. 6. About where did this rod break which you had mended?

A. About two foot from the centre of the car, where it connects with the cross-bar which applies the brakes.

Q. 7. Please state whether there was or was not a pawl and ratchet in use at that time on the brake-staff and crank by which the brake was applied?

A. There was none.

Q. 8. How, then, was the power held?

A. Some would wind them up and stand and hold them, and some would tie them.

527 Q. 9. Do you know of the use of this brake on any other cars of that road while you were in the employ of said Amboy Company? If so, state what you know about the use of such brakes.

A. Yes, sir; there were several put on what we called the box-cars.

Cross-examined by M'r Cozzens:

Cross 10. You say you went into the shop of the Camden and Amboy Company in 1847; what sort of work did you do in that shop?

A. Repairing crates and cars. Sometimes making new brakes.

Cross 11. Was it part of your duty to repair brakes if they broke down?

A. That is what my occupation was altogether in repairing?

Cross 12. Can you give any idea how many brakes you repaired while you worked in that shop?

A. The first year (1848) we repaired but very few. In 1850, 1851, and 1852 they got more of that class of cars on, and there was more work to do, and the boss had to put more men on. There were only two of us at the first start. It is a hard matter for me to state. We may have repaired 4 0 or 500 brakes a year. I could not state. There were more or less coming in and going out all the time.

Cross 13. When you say that class of cars, what kind of cars do you refer do?

A. I mean eight-wheel cars. When I first went there they were four wheels.

Cross 14. Were these cars that you have been speaking of so far freight-cars?

A. The first one I have been speaking of was a passenger-car. The remainder were freight-cars.

Cross 15. Did there get to be a good many of these brakes, which operated on both trucks on the Camden and Amboy road in 1850, and 1851, and 1852?

528 A. They got to be pretty tolerable plenty, not over and above. They continued to increase during those years.

Cross 16. Do you remember brakes on the Camden and Amboy road, sometimes called the Hodge brake, which had two cross-levers under the body of the car?

(Objected to.)

A. Yes, sir.

Cross 17. Did you repair any of those Hodge brakes?

A. Yes, sir.

Cross 18. Did you repair any of those Hodge brakes in either of the years 1850, 1851, and 1852?

A. I do not recollect the year. I could not say on those cars, we had so many four and six wheel cars. There were a great many of them in operation in those years, and they were not fully done away with until 1854. I mean by "those cars," as above stated, those with the Hodge brake.

Cross 19. Were those cars with the Hodge brake freight-cars?

A. I guess some of them were emigrant-cars. I think some of them were freight-cars, but could not say positively.

Cross 20. Were the eight-wheel cars, the brakes of which you repaired, the same kinds of cars after the Hodge brake began to be used as they were before?

A. Well, I think they were very nearly the same kinds. I don't recollect particularly about that.

Cross 21. You say in your fourteenth cross-answer that the cars you were speaking of before you were asked about the Hodge brake were, with the exception of the first one, freight-cars, and you now say that the cars the brakes of which you repaired after the Hodge brake came into use were the same kind as you repaired before it came into use. Is it not, then, the necessary consequence that the Hodge brakes you repaired were on freight-cars?

(Objected to for the reason that the manner of putting the question is calculated to confuse the witness.)

529 A. I don't recollect about that.

Cross 22. Are you able to state what kind of a car it was that the Hodge brakes you repaired were on?

A. I think most of them were emigrant-cars, but can't state positively.

Cross 23. Can't you state any time when you repaired any of these Hodge brakes?

A. I would not be willing to state any certain time.

Cross 24. Did you repair them before you did away with the four and six wheel cars?

A. Four and six wheel cars were not fully done away till 1855; in the spring, I think. We did not do away with the four and six wheel cars. They were used more or less in peach time.

Cross 25. How long before you left, which you say was in 1855, did you repair Hodge brakes?

A. I could not say for certain how long?

Cross 26. Did you repair any at all?

A. I think I did in the course of the ten years that I worked for them.

Cross 27. Are you sure whether you repaired any of them or not?

A. I think I did, but I couldn't say sure.

Cross 28. Were there a great many Hodge brakes on the road before you left?

(Objected to, for the reason that it is evident the witness knows nothing about the Hodge brake, and the counsel for plaintiff is called upon to ask the witness to describe the Hodge brake before he proceeds further.)

A. Well, if I understand what you mean by the Hodge brake, I said there were a good many different kinds of brakes, but I may not understand what the Hodge brake is by the name.

Cross 29. In the fifteenth cross-question the Hodge brake was spoken
of to you as a brake which had two cross-levers under the body
530 of the car; now were there before you left a good many of those
brakes on the road which had two cross-levers under the car?

A. There was not a great many.

Cross 30. You remember that there were some, do you?

A. Yes, sir.

Cross 31. State, as nearly as you can, how long before you left the first of the brakes with those two cross-levers came onto the road?

A. I don't know that I can state the precise time.

Cross 32. Can you state whether it was a year before?

A. It might be a year, it might be three, and it might be five. I can't say for certain.

Cross 33. Do you remember what time it was that, as you say, you repaired a brake on the first car you spoke of, independently of the time your wife was confined, or is that the only means of fixing the date that you have?

A. That is the only means I have of fixing the date, the birth of my son and the trouble I had in fixing the brake, being a new hand in the shop.

Cross 34. Had you repaired brakes that operated only on four wheels before that time?

A. I repaired brakes that only operated on one end of the car before that time.

Cross 35. Did you repair a good many of them?

A. Not a great many of them. Our work was not very much the first year.

Cross 36. Did you ever have to repair any of them when the rod which ran from the lever in the truck to the brake beam on the other side of said truck was broken?

A. I don't know as I recollect, though I might.

Cross 37. In repairing brakes which operated on both trucks, did it happen every once in a while that one or the other of the rods connecting with the cross-lever was broken?

A. I don't recollect but the one car, and that was the first one.

Cross 38. Will you say that during the whole seven years that you
say you repaired double brakes, that you never knew of one in
531 which neither of the rods connecting with the cross-lever was
broken, except the single instance you have named?

A. I don't think that I did.

Cross 39. While you were repairing brakes during this seven years, did you often have to take one or the other of the rods connected with the brake gearing to the blacksmith's shop to be mended?

A. Not of that class.

Cross 40. Did you of any class, and if so, what class ?

A. Of the eight wheels, here they only broke on four wheels, I have taken them to the blacksmith's very frequently.

Cross 41. Will you say that during the whole seven years you never knew of any of the rods connected with the brake gearing of the double brakes, breaking on eight wheels, needing to be taken to the blacksmith shop to be mended, except in the single instance you have named ?

A. That was the only one I took, and I do not know of it, except in that instance.

Cross 42. When, before the present time, within this year, 1867, did anybody call your attention to or ask you about what you knew as to the use of double brakes on the Camden and Amboy road ?

A. I don't recollect anybody, except I heard them talking about being a lawsuit ?

Cross 43. Who did you hear talking, and what did they say ?

A. John Morgan was the man I heard talking about it, the painter; he said the company had a big lawsuit going on, but he did not tell me what it was about, and I didn't ask him.

Cross 44. What company had a big lawsuit ?

A. The Camden and Amboy.

Cross 45. Is that all that was said ?

A. That is all that I recollect was said; I was busy.

Cross 46. How did that remark call your attention to what you knew about double brakes ?

A. We were working in a Presbyterian church, and he was talking
about the company's having a big lawsuit, and a good many hav-
532 ing to go from Amboy, and I turned around and asked him what
it was about, and he made me no answer; he and the foreman
were busy, and he said it was a big lawsuit.

Cross 47. Is that every word that was said ?

A. That was every word that I heard.

Cross 48. As that remark did not make any mention at all of double brakes, how did it call your attention to the subject ?

A. After I was subpœn'ed last night, and was told what I was to go for, I then put my mind to the subject to recollect all I could about it.

Cross 49. Then you were supœn'ed before you knew what you were to testify to, were you ?

A. I was sir; I did not know what the suit was about.

Cross 50. Who subpœn'ed you ?

A. M'r William Disbrow.

Cross 51. Is he the same M'r Disbrow who has testified in this case ?

A. I suppose so; I wasn't here.

Cross 52. Is he your cousin ?

A. Yes, sir.

Cross 53. You said M'r Lockwood sent him to you; is that so, and what M'r Lockwood ?

A. That is what he told me; I don't know his first name, and am unacquainted with the man; he resides at Bordentown.

Cross 54. When your cousin subpœn'ed you, what did he say to you ?

A. He said they wanted me to come up to New York on the trial; I was to bed when he came, and I don't recollect what he did say.

Cross 55. Is what you have stated all that you can remember that he said ?

A. Well, pretty much; he told me to meet him and we would go down together in the boat.

Cross 56. Did you talk together about this lawsuit on the boat?

A. No, sir; I don't recollect of saying anything about it on the boat.

Cross 57. Nor about double brakes?

533 A. No, sir; I don't think we did; I am certain we did not, because we were not together long on the boat.

Cross 58. Then do you say that before giving your testimony to-day you had no conversation with anybody about the lawsuit and about double brakes, except the conversation with your cousin last night?

A. Not until I got here; I had a little conversation with the counsel; I don't know what his name is.

Cross 59. That you mean was this morning, do you, just before you were sworn?

A. Yes, sir.

Cross 60. Do you remember a brake on the Camden and Amboy road called the McLoughlin brake, which was worked by the car bumpers? (Objected to for the reason that it has nothing to do with the matters at issue.)

A. I recollect seeing one on the passenger line, but don't know how it was put on. I understood it was worked by the engine, but don't know.

Cross 61. State as near as you can how long before you left the road.

A. Well, I think likely two or three years.

Cross 62. Can you say that it was more than one year?

A. I could not.

Cross 63. Was that the only brake worked from the engine which you ever saw on the road?

A. I could not tell you. I think it was the only brake of that class I ever saw on the road.

HENRY H. DISBROW.

Subscribed and sworn to before me this 6th September, 1867.

R. E. STILWELL,
Examiner, &c.

534 **Charles Cox**, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Charles Cox; 47 years of age; reside at South Amboy, New Jersey, and am an engineer.

Q. 2. When did you first enter the employ of the Camden and Amboy Railroad Company, and when did you leave their employ, and what did you do during the years intervening?

A. In 1842; I left in 1850 or 1851; I cannot give the date. In 1842 I was chipping railroad iron for the track; in the spring of 1843 I was employed as a blacksmith in the company's shops; in the spring of 1846 I went on the road firing; in the spring of 1848, in February, I took an engine, the one that Colt Walcott run; he had taken the one that Joseph Cox had run, Joseph Cox having been killed.

Q. 3. At the time of taking Walcott's engine to run, or soon thereafter, did you know of the use of double-acting brakes on that road? If so, what circumstance fixes the thing in your mind, and the date?

A. The circumstance I have which fixes it in my mind is that I lost a child that year. I ran to meet every mail train, and I would wait there on the turn-out until the train from Philadelphia and from New York arrived; while standing there I saw the brake applied, and the wheels on the trucks of the cars at both ends slipping; I saw that scores of times during the years I was running there.

Q. 4. What kind of a car or cars did you see the wheels sliding on both trucks when the brake was applied?

A. On a flat crate car.

Q. 5. Do you wish to be understood that you fix the date of taking Walcott's engine to run, by the death of your child?

A. Yes, sir.

Q. Do you know of the use of this double brake upon any other car or cars on that road before 1850 or 1851?

A. It was on two cars; one crate car in each train.

Adjourned to the 7th instant, at 11 a. m.

535 SATURDAY, *September 7th*, 1867.

Present, counsel as before.

Cross-examined by M'r Cozzens:

Cross 7. You say you fix the time of seeing the wheels slip by the death of your child; what connection is there between those two circumstances?

A. I took an engine in the spring of 1848, and I lost the child July 12th, same year.

Cross 8. Do you not see that the loss of your child has nothing at all to with your seeing the wheels of cars slipping. How, then, does that enable you to fix the time?

A. It brings the date of the year fresh in my mind.

Cross 9. What if it does; what connection is there between the two circumstances?

A. The connection that I had to meet every mail running through Trenton.

Cross 10. What has that to do with it?

A. In meeting every train I was on the turn-out. While I was standing there the trains would approach; the brakes were applied by one brakeman only, both trucks of the car sliding.

Cross 11. Then you mean, do you, that you remember seeing the wheels slip by the fact that you were running to meet the mail train?

A. Yes, sir.

Cross 12. For how long a time were you engaged in running to meet these mail trains?

A. Over a year. I left there in the spring of 1849.

Cross 13. Are you sure you left there in the spring of 1849?

A. Yes, sir.

Cross 14. Upon how many cars in those mail trains were those brakes either double or single?

A. I noticed one car in each train. I think there were brakes on all the cars; I can't say what kind of brakes; the brake was 536 applied to one car. There was only one brakeman to a train at that time, for the whole year I was running there.

Cross 15. Was there only one brakeman upon each of these trains, and were the brakes applied upon only one car on each of them?

A. There was only one brakeman on each train, and, to my knowledge, only one brake applied.

Cross 16. How many cars did those mail-trains average?

A. From five to seven.

Cross 17. Where did those trains run to?

A. From Jersey City to Bristol.

Cross 18. They were the regular and only mail-lines running to Jersey City at that time, were they?

A. The only mail lines; yes, sir.

Cross 19. Who were the brakemen on those trains?

A. I can't remember the last name of one of them. I can remember the first name of one of them; his name was Barney; this was his first name. I can't remember the name of the other one.

Cross 20. Did you never see the brakes applied to any of the other cars in these trains except the car you have referred to?

A. No, sir.

Cross 21. And you never saw the wheels of any of the other cars slip?

A. Not connected with that train.

Cross 22. Did you ever see the wheels of any car connected with any other train slip?

A. Yes, sir.

Cross 23. What kind of brakes were there on such cars?

A. I never crawled under the cars to examine them. I judge from there being two cranks and one brakeman that they must have been a double brake.

Cross 24. What did you say about these brakes having two levers?

A. I don't mean to say anything about the brakes having two levers.

Cross 25. Didn't you say they had two levers?

537 A. I found my mistake, and applied it to the crank on the top of the car.

Cross 26. Did you ever, at any time, see the wheels of any of the cars slip, except those which had the double brakes?

A. Yes, sir.

Cross 27. When?

A. I have seen them at different times, in 1848 and 1849.

Cross 28. Were not the wheels of the cars with single brakes constantly liable to slip when the brakes were applied?

A. One end was.

Cross 29. Did you see them so slip very frequently during the years 1848 and 1849?

A. Yes, sir.

Cross 30. Did you after 1849 and up to the time you left?

A. Yes, sir.

Cross 31. In what trains?

A. Different trains; dirt-trains and wood-trains.

Cross 32. Any others?

A. I don't recollect any others distinctly.

Cross 33. Now, will you swear positively that you saw the wheels slip in both trucks of each of these cars on these mail-trains on which the brakes were applied as you say?

A. Yes, sir.

Cross 34. Did you always look to see whether they slipped or not?

A. Yes, sir. When I was standing there my attention was drawn towards the train as it was approaching.

Cross 35. You were standing there every morning and every night, were you not?

A. Yes, sir.

Cross 36. And you saw the wheels slip every time you were standing there, did you?

A. Every time the train passed me. Every time I was standing there I saw the wheels slip when the train came in.

Cross 37. Where were you at those times?

538 A. Sometimes on the engine, and sometimes standing on the ground.

Cross 38. What made you look to see whether the wheels slipped every time the trains came in?

A. What drew my attention was the fire flying out from under the truck.

Cross 39. What time did the morning mail-trains reach the place where you were standing?

A. At half past eleven.

Cross 40. Was there much talk among the railroad men about these brakes on the mail-train?

A. Not to my knowledge.

Cross 41. Didn't you hear anybody talk about them?

A. No, sir; not during my running on the road.

Cross 42. When did you hear anybody talk about them?

A. The first I heard anything was about three or four weeks ago.

Cross 43. Did you never, while you were running on the road, hear any talk about double brakes on any of the cars?

A. No, sir.

Cross 44. Did you get down under the cars on these mail-trains on which the wheels slipped to see what kind of brakes they had?

A. No, sir.

Cross 45. Could a person have seen how the brakes were arranged under the cars unless he did so?

A. He could see nothing but the blocks which took effect upon the wheels. I never saw anything of the brake except the blocks, which were applied to the wheels. I should judge a person could not see how the brakes were arranged unless he stooped down.

CHARLES COX.

Subscribed and sworn to before me this 7th September, 1867.

R. E. STILWELL,
Examiner, &c.

539 WILLIAM DISBROW, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. William Disbrow; 39 years of age; reside at South Amboy; and am a locomotive engineer on the Camden and Amboy road.

Q. 2. When did you enter the employ of that company, and are you now employed by the same?

A. On the 11th June, 1847, and am still employed by them.

Q. 2. What did you do for that company in 1847?

A. I fired a locomotive.

Q. 4. Do you know anything of the use of double brakes on that road; if so, what do you know, and what circumstances, if any, do you connect with such knowledge?

A. I do know of double brakes on that road. The first I knew of them was in the winter of 1847. I was firing on the Amboy line. At the end of our route at Camden, New Jersey, one of the cars was thrown from the track from some cause. It was a flat car for carrying baggage, and I was sent under this car, which was off the track, to disconnect the brake, by the engineer, which I did with a hammer and cold chisel. The brake had a cross lever in the centre of the car with four rods attached to the cross bar. I disconnected all the rods from the cross lever.

Q. (Witness is here shown Exhibit A, and is asked in relation to the brake, what it represents.)

A. It represents the brake I had to do with, and such as was on the car before spoken of.

Q. 6. (The attention of the witness is now called to the cranks by which the power is applied to the brakes) and is asked if there was a pawl and ratchet applied to the staff for the purpose of holding the power when applied by the brakeman. Please explain in relation to this matter.

A. No, sir; there never was any ratchet, to my knowledge, for some years after that.

540 Q. 7. Does the model correctly represent the staff and crank above the platform as seen in Exhibit A, as used in 1847 and thereafter, or not?

A. It does represent it exactly.

Q. 8. What do you know of the use of this brake on the cars of that road from 1847 to the present time?

A. Well, they have it in operation from that time to the present. I have seen it in operation.

Cross-examined by M'r Cozzens:

Cross 9. You say they have had the double brake in operation from 1847 to the present time. On how many cars was it in operation in 1847?

A. Only one, to my knowledge, in the latter part of 1847.

Cross 10. What car was that?

A. It was a flat car; the same one I have referred to.

Cross 11. How many in 1848?

A. I couldn't tell how many; no more, to my knowledge, than one.

Cross 12. How many in 1849?

A. Well, sir, there was some five or six, to my knowledge; box cars.

Cross 13. Do you mean box freight-cars?

A. Yes; freight cars.

Cross 14. How many in 1850?

A. I don't know whether they had any more or not.

Cross 15. How many in 1851?

A. I couldn't say.

Cross 16. Do you know whether they had more than in 1850?

A. No, sir.

Cross 17. How many in 1852?

A. Well, there were considerable more at that time; they became quite plenty, but I couldn't say how many.

Cross 18. Have you any knowledge of a brake on the Camden and Amboy road called the Hodge brake, having two cross levers under the car body?

541 A. No, sir.

Cross 19. Did you never see any such brake on any of the cars?

A. No, sir.

Cross 20. Have you any knowledge of any brake on the Camden and Amboy railroad called the Stevens brake, having four upright levers under the car?

A. No, sir.

Cross 21. Have you any knowledge of any brake on the Camden and Amboy railroad called the McLoughlin brake, which was a train brake operated from the engine?

A. Yes, sir.

Cross 22. When did you first know of the McLoughlin brake?

A. I couldn't tell within a year or two; perhaps more. I think it must have been along in 1853 or 1854; somewhere in that neighborhood. Am not positive.

Cross 23. Upon how many cars was the McLoughlin brake used?

A. It was used in the Amboy train, from five to seven cars, and, I think, it was used on all of them.

Cross 24. What caused the baggage-car to be thrown from the track at the time mentioned in your direct examination?

A. I don't know, sir, only as I was told.

Cross 25. What was you told?

A. The engineer told me that the brake had got down, and threw the car off the track.

Cross 26. What part of the brake?

A. The rod was bent underneath, and my orders were to disconnect it. I disconnected the rods in the centre of the car. I don't know what part of the brake was down.

Cross 27. Did you see any part of the brake down?

A. No, sir.

Cross 28. How long did you fire on that Amboy line?

A. I think, sir, only to the end of 1847; I am not positive.

Cross 29. When did you commence firing on it?

A. Some time in the fall. It was cool weather, at any rate. It might have been in the fore part of the winter.

542 Cross 30. How long after you commenced firing on that line did this car get thrown off the track?

A. It was the first day I ever fired that line.

Cross 31. Did that car ever get off the track at any other time?

A. Not to my knowledge.

Cross 32. What did you do after you got through firing on that line?

A. Firing a dirt train.

Cross 33. What part of the road did that dirt train run on?

A. South Amboy.

WILLIAM DISBROW.

Subscribed and sworn to before me this 7th September, 1867.

R. E. STILWELL,
Examiner, &c.

PATRICK BOGY, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Patrick Bogy; 55 years of age; live at South Amboy, New Jersey, and am helper in the machine shop of the Camden and Amboy Company.

Q. 2. When did you first enter the employ of said company, and how were you employed thereafter?

A. On the 10th of May, 1842, I went to work in the freight depot, and worked there until the 4th of July, 1843, when I went on the railroad as a brakeman on a freight train, with a passenger car attached. I was about five years a brakeman, and then I was put on as a conductor on a freight train.

543 Q. 3. While brakeman did you know anything about the use of double brakes on that road; if so, what do you know, and what circumstances, if any, called your attention to such brakes?

A. I saw the brake on the Tyler car, and on a flat car which carries the baggage. I have been in Camden, and saw the mail trains go in and out there every day, and I saw the brakeman put on the brake on this Tyler car, and saw the wheels slide in both trucks.

Q. 4. Was this circumstance of sliding the wheels in both trucks what first called your attention to this brake?

A. By hearing other men talk about this brake I made it my business to go and look under the car, and see how the brake was connected, and I found it connected by a lever under the centre of the car; when the man took hold the crank on one end of the car, it applied the brake to both trucks, and it made the wheels slide under both trucks at each end of the car.

Q. 5. How soon after you became brakeman in 1843 did you observe this double brake?

(Objected to.)

A. I observed it along in 1844 and 1845.

Cross-examined by M'r Cozzens:

Cross 6. Where did the freight train you were brakeman of run to?

A. From South Amboy to Camden.

Cross 7. How many hours was that freight-train usually on the road from South Amboy to Camden?

A. Sometimes five, sometimes six and seven hours, according to whether we met with any trouble on the way.

Cross 8. When you did not meet with any trouble, how many hours was it?

A. Well, it would go in five and six hours.

Cross 9. Did it usually run in that time?

A. When it did not meet with any accidents or delays on the road it did.

544 Cross 10. About how many times a week did it run in five or six hours?

A. It run at all times when it did not meet with any accidents or delays.

Cross 11. About how many times a week did it meet with accidents or delays?

A. That is more than I can tell now.

Cross 12. When it ran over in five or six hours, what time did it reach Camden?

A. We had no certain time on freight trains at that time.

Cross 13. Did you have any fixed time for leaving South Amboy?

A. We left there whenever the train was ready.

Cross 14. Did you leave South Amboy in the morning or in the afternoon?

A. I said we left there whenever the train got loaded and was ready.

Cross 15. Is that the best answer you can make?

A. Yes, sir.

Cross 16. Did the train ever leave South Amboy in the afternoon?

A. Yes; it left in the afternoon if it was loaded.

Cross 17. Do you remember any time when it left in the afternoon?

A. I can't bring it to memory now.

Cross 18. Did it ever leave South Amboy in the morning?

A. It left there when it was loaded at any time.

Cross 19. Can you remember any time when it left in the morning?

A. Not now I can't; not a certain time.

Cross 20. Can you recollect any time?

A. No certain hour; I can't.

Cross 21. I havn't asked anything about any certain hour. I ask if you can remember any time when it left in the morning?

A. I say it left whenever the train was loaded and ready; I can't remember any more than that now.

545 Cross 22. Was the time when that train reached Camden very uncertain?

A. Whatever time it could get there.

Cross 23. Did it have any regular time for leaving Camden to return to Amboy?

A. No, sir; no regular time.

Cross 24. How long were you brakeman on that train?

A. About five years.

Cross 25. Did you run on every trip of it during that time?

A. Not every trip; if I was sick I had the privilege to lay off.

Cross 26. Did you run every trip except when you was sick?

A. No, sir; if I had anything to do for myself, to go to New York to do a little business, or if I wanted to get in a little hay for myself—I kept a cow or two—or do any little business for myself in New York, or anywhere else, I also had the privilege.

Cross 27. Well, were you off pretty often during the time?

A. As often as occasion required me to do so.

Cross 28. Did occasion require you pretty often?

A. Well, as often as I wanted to do business for myself.

Cross 29. How often was that?

A. I believe that is the same question I have been asked, according as I view it; it was as often as my business required me.

Cross 30. Can't you state how often your business required you?

A. No, sir, I can't state how many times; it was as often as I wanted to.

Cross 31. Were you away a good many times during the five years?

A. As often as my business required me, or occasion led me to go.

Cross 32. Can't you state whether you were away pretty often during the five years?

546 A. I can't say how many times, probably a dozen times; and it may be more and it may be less.

Cross 33. Can you say whether you were away a dozen times, or whether you were away only twice?

A. No, sir, I can't say how many times; it might be a dozen, and it might be less; I can't say whether it was a dozen times or only twice.

Cross 34. Where did you live at that time?

A. At South Amboy.

Cross 35. You say you saw the brakeman put on the brake on the Tyler car; did the Tyler car run in the mail train at the time you observed it?

A. Yes, sir.

Cross 36. You said in your direct examination that you observed this double brake along in 1844 and 1845; will you say that it was the Tyler car you saw it on at this time?

A. Yes, sir.

Cross 37. Did you see it on the Tyler car in the mail-train in 1845?

A. I did, sir; and in 1844.

Cross 38. May it not have been later than 1845 when you first saw it?

A. No, sir; I first saw it in 1844.

Cross 39. What makes you think it was in 1844?

A. Well, I being sick, and having a doctor's bill to pay, and his bill was dated October, 1844; another thing that recalls it to my mind is, that I heard men talking about it, and it made me more anxious to see the car, more particularly to see how the brake was rigged on it.

Cross 40. What did you hear the men say about it?

A. I heard the engineer say that when the brakeman applied the brake on the Tyler car, that he felt the engine jerk, by means of having this brake put on; I heard them remark that it was such a good brake that if they had more of them they would not have so much trouble.

Cross 41. How did you know that the men did not say this in 1845?

547 A. As I said before, I had a doctor's bill to pay—(I had the intermittent bilious fever)—and the bill was receipted October, 1844.

Cross 42. Is that all you can say about it?

A. That is my meaning for its being in 1844, for a few days afterwards I was taken sick.

Cross 43. Was there a considerable talk about that brake?

A. Well, yes, sir.

Cross 44. Was it spoken of as a new thing?

A. It was spoken of as being on the road from the time the Tyler car came on it.

Cross 45. Did you hear a good many speak of it?

A. I heard the engineer and fireman.

Cross 46. Did you ever see a brake used on the Camden and Amboy cars, called the Hodge brake, with two cross-levers under the car-body?

A. I never heard tell of such a name for a brake until I heard it in this court-room, and I never saw such an one, to my knowledge.

Cross 47. Did you ever see a brake on the Camden and Amboy cars called the Stevens brake, with four upright levers under the cars?

A. No, sir.

Cross 48. Did you ever see a brake on the Camden and Amboy road, called the McLoughlin brake, which was worked from the engine?

A. No, sir; I never saw it, nor heard tell of it, till I came here.

his
PATRICK + BOGY.
mark.

Subscribed and sworn to before me this 7th September, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to the 9th inst., at eleven a. m.

548 MONDAY, *September* 9*th*, 1867.

Present, counsel as before.

ANDREW HEATH, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation; and by whom employed, and how long, and in what capacities?

A. Andrew Heath; 51 years of age; reside at Camden, New Jersey, and am captain of the steamboat State Rights. I am employed by the Camden and Amboy Railroad Company. I think I went with the company in 1838 or 1839; I am not sure when I first went with them. I engaged to drive a horse-car on that road. I then went as brakeman. I then went as baggage-master, then as conductor, and then as captain on steamboat Washington, and have continued as captain of various boats in their employ, up to the present time.

Q. 2. About what year did you commence as conductor on the Camden and Amboy road?

A. In 1843.

Q. 3. While so engaged, do you recollect taking a special train over that road with the President of the United States on board; if so, at what time, and what circumstances, if any, is connected with the event?

A. I do; it was in 1843; I think it was in June; I can't say exactly what day. I took the President from Camden and left him at Princeton.

Q. 4. Do you know of the running of trains on the Camden and Amboy road, called "Bay Excursion Trains"; if so, in what year or years, were such trains run? Please state from your own personal knowledge, and were you conductor on said trains.

A. I do; in 1843 and 1845. I was conductor on those trains.

Q. 5. Please state whether you know of the use, in said Bay Excursion Trains, a car called the Tyler car.

549 A. I do.

Q. 6. Do you know who was engineer on the excursion trains which you run in 1845? If so, please state, and who fired, and who was brakeman.

A. Yes; Charles Yundt; John Holland fired; I can't remember who was brakeman.

A. HEATH.

Subscribed and sworn to before me this 9th September, 1867.

R. E. STILWELL,
Examiner, &c.

ROBERT C. BUZBY, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Robert C. Buzby; 67 years of age; reside at Bordentown, New Jersey, and am time-keeper and clerk for the Camden and Amboy Railroad Company.

Q. 2. How many years have you been in the employ of said Camden and Amboy Railroad, and how employed at different times?

A. Thirty-four years the 4th day of last March. The first four years I was employed firing and running a locomotive; most of the time as engineer. Not quite two years I was captain of the ferry-boat running from Camden to Philadelphia. After that, in 1840, I went in the Camden and Amboy office as clerk and time-keeper, and have been employed there ever since.

Q. 3. Do you know Edwin Lockwood; if so, will you refer to your time-book and see if his name is recorded there in the year 1843?

(Objected to.)

550 A. I am positive without looking. The book is in my own handwriting; kept by me at the time of the different dates.

Q. 4. Will you please look in your time-book and see if you find the name of Nicholas Smith, called Nic Smith? If so, when did he enter the employ of the Camden and Amboy Railroad Company, and is his name entered in your own hand?

(Objected to.)

A. I find the name of Nic Smith under date of November 19, 1845; it seems to be the first entry on this book of his name, and is, and it is my handwriting.

Q. 5. Please refer to your time-book, and see if you find the names of George Stockham, Letchworth Cox, and William Venable, in the year 1845.

(Objected to.)

A. I do, and they are in my own handwriting.

Q. 6. And do you also find in the year 1846 the name of Charles Cox?

(Objected to.)

A. In 1845 and 1846, and in my own handwriting.

Q. 7. Will you please refer to the engineer's time-book, and see if you find the names of Charles Yundt and R. C. Walcott, in the year 1843; and, if so, are those names likewise in your handwriting?

(Objected to.)

A. I do find them, and they are in my handwriting.

Q. 8. Do you know George W. Thompson, R. C. Walcott, Thomas
551 Herbert, and Asher Pancoast? If so, state whether you know of
their being in the employ of the Camden and Amboy Railroad Company prior to the year 1847.

A. I know them all, and knew them at the time they were employed by them, except George W. Thompson, who was only employed when we had a job for him; I knew George W. Thompson also, and he was employed as early as 1840, in doing jobs in his line for the company; he done some of the work at his own shop, and some at the shop of the company; when it was to be applied to a car he came to the shop and put it on; he was a worker in tin and sheet-iron.

Q. 9. Are you personally acquainted with all the persons whose names appear in the foregoing questions, and do you know that they are or have been in the employ of said Camden and Amboy Company?

A. I am personally acquainted with all of them, and most of them are still in the employ of the company.

Q. 10. Will you please refer to the engineer's time-book under date of June 10, 1843, and see if you find the record of a special train over the Camden and Amboy road? If so, what is that record, and is that record in your own hand?

A. I find June 10, 1843, engine No. 16, Charles Yundt, engineer, and J. Holland, special train, with the President, Bordentown to Camden and back, and to Princeton, and then back to Camden, and the record is in my own handwriting.

Q. 11. Who was fireman?

A. John Holland was fireman.

Q. 12. Do you know of the use of a car on that road called the Tyler car, and do you know what brakes it had on before it left the shop in said special train to take the President of the United States over the Camden and Amboy road? If so, what do you know, and the circumstances associated with such knowledge?

(Objected to).

A. I do; it had a brake on which worked from each platform
552 of the car; all I know about it is, that it being a new car, or it
was new to us there; it had just come from the Philadelphia and Trenton road, and was fitted up in our shop, and I don't think it ran on our road till it was fitted up; I went around daily to take the time of the men in the shop; it was fitted up different from anything we had had before, made me notice it; it had different kind of springs from any we had had before; it had spiral springs, in connection with some other kind of springs, elliptic, I think they called them; I took notice of the brake, and looked underneath to see why, by turning one crank at one end of the car, it would put the brakes on the wheels of both trucks; I found it was by a cross-lever being fastened under the bottom of the car.

Q. 13. Was it new or not when it came from the Trenton road, and was the brake you speak of applied to it at the time it was refitted or not?

(Obiected to.)

A. The car was not *k*new when it came there from the Trenton road, and the brake was applied to it before or at the time it went out to take the President of the United States over the road.

Cross-examined by M'r Cozzens:

Cross 14. Does the alleged record referred to in your tenth direct answer say anything about what car or cars were in the special train mentioned, or what kind of brake such car or cars had on?

A. It does not.

Cross 15. Is there anything anywhere in the book from which you read such alleged record which states anything about either of those matters?

A. No; there is no other record in the book touching these matters that I know of.

Cross 16. Was there any book of any kind kept on and between 1843 and 1850 which contained any record of what the work was which the hands on the road did?

553 A. There was not, except as appears here in the books I have been reading from.

Cross 17. What appears on that subject in these books?

A. All that appears here is merely such a man was at work repairing cars or a car.

Cross 18. Does anything more appear by those books than in one column, in ink, a list of names of hands in the employ of the company, and then in another parallel column, in pencil, the words "car" or "car-shop," or "R. R. track," or some such short word, without any minute of what the work was which was done by the men on such car or car-shop, or track, &c.; and does the engineer's time-book, so called, contain anything except the names of the engineers and firemen, and the places between which their trips were, and here and there a remark briefly descriptive of what the business of the trip was?

A. Nothing else, I believe.

Cross 19. Is there anything at all of any kind, on any subject, in relation to the alleged record, referred to in your tenth direct answer, except what you stated in that answer?

A. I think not.

Cross 20. Is there a single word in either of those books on that subject except what you stated in that answer?

A. I can't say that; I hav'n't examined the books; I don't recollect of any at present; there may be.

Cross 21. Have you any knowledge of the use of a brake on the Camden and Amboy road, called the Hodge brake, having two cross-levers under the car bottom?

(Objected to.)

A. No, sir.

Cross 22. Did you ever know that that brake was in use for a considerable time, on a good many cars, on the Camden and Amboy road?

A. No, sir; I don't know anything about the Hodge brake.

554 Cross 23. Did you ever know of the use of a brake on the Camden and Amboy road, called the Stevens brake, having four upright levers under the car body?

(Objected to.)

A. I do not.

Cross 24. Did you ever know of the use of a brake on the Camden and Amboy road, called the McLoughlin brake, which was a train-brake worked from the locomotive?

(Objected to.)

A. They have had a brake on the road which was worked by the locomotive, I think.

Cross 25. Did you ever know that a brake worked by the locomotive was applied on the Camden and Amboy road to, at least, one entire train of cars, running on one of the mail lines, and was so used there for a considerable time?

A. I only know it from hearing men speak of it; I don't know anything about it.

Cross 26. You then never saw such a brake on such a train?

A. I can't say whether I ever saw it or not; I never noticed it.

(The car-book, and the engineer's book referred to by the above witness, are now put in as evidence by defendant's counsel, and marked A 1 and A 2.—R. E. STILWELL, *Examiner, &c.*

(Objected to.)

R. C. BUZBY.

Subscribed and sworn to before me this 9th September, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to the 10th instant, at 11 a. m.

555 TUESDAY, *September 10th*, 1867.

Present, counsel as before.

ROBERT S. VAN RENSSELAER, being called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Robert S. Van Rensselaer; about 60 years of age; reside at Bordentown, New Jersey, and am superintendent of the Camden and Amboy, and Philadelphia and Trenton Railroads.

Q. 2. How long have you been so employed by said company as superintendent?

A. I can't speak with certainty as to the time I was appointed superintendent of the road; I was appointed assistant superintendent of the Camden and Amboy road in 1849 or 1850, I can't tell which, and continued to act in that capacity until I was appointed superintendent, which was in 1855 or 1856, I think; I can't say that either of these are positively correct.

Q. 3. Do you know of any party or parties calling on the Camden and Amboy Company, at any time or times, for a settlement of patent-claims on brakes; if so, what were the views entertained by said company relative to those claims; by whom were they made, and have they been settled; if so, why was settlement made?

A. Yes, sir, I do; the first claim that I remember was a person representing the Hodge brake; it may have been M'r Hodge himself; it was settled in 1851, by direction of the President of the Company, M'r Robert L. Stevens, to avoid litigation, but not acknowledging the validity of any patent; the next, I think, was the Tanner brake party, represented by a M'r Sayles, that was also settled for in 1855; I remember in conversation with M'r Lockwood, that he objected to settling for them, as he did not consider them valid claims, as the brakes were in use by the company; I mentioned the objection of M'r Lockwood

556 to the officers of our company, the president and superintendent; and I know perfectly well, as to the Hodge brake, M'r Robert Stevens said, "You had better pay for it, if it is reasonable, rather than to litigate it;" M'r Lockwood also objected to the paying of the brake in dispute here, the Tanner brake as it is called, on the same grounds, but it was settled for by order of the superintendent or executive committee, I don't know which; my impression is, that that was settled for, also, to avoid (impression objected to) litigation, but am not certain.

(Objected to what M'r Lockwood said.)

Q. 4. What position did M'r Edwin Lockwood occupy, and does he now occupy the same?

A. He was master car-builder at that time, and still is, for the company.

Q. 5. When M'r Lockwood was consulted with regard to the use of double brakes on that road, did he or not say that the brake belonged to the company?

(Objected to.)

A. I can't say that he did at that time, but he has repeatedly said so since.

(Objected to.)

Q. 6. Did he object to the settlement with Hodge for his claim on brakes in 1851, upon the ground that the brake belonged to the company?

(Objected to.)

A. I can't repeat his language, and can't say whether he said the brake belonged to the company or not.

557 Q. 7. What did you understand in relation to this matter from conversations you had had with M'r Lockwood?

(Objected to.)

A. That the brakes were invented and introduced on to the cars at the company's expense.

Q. 8. And did M'r Lockwood then refer to the double brake then in use upon the cars of the Camden and Amboy Road?

(Objected to.)

A. Yes, sir.

Cross-examined by M'r Cozzens:

Cross 9. State as nearly as you can when the Hodge brake first went into use on the Camden and Amboy Road?

A. I know nothing about it, sir, except from hearsay.

Cross 10. How much did the company pay in settling for the use of the Hodge brake?

A. All I know of is $300; that is all I have any knowledge of.

Cross 11. Have you a knowledge of all that was paid?

A. I can only say that this was paid on the order of the president, $300; I think that was all that was paid; that is the only voucher I can find.

Cross 12. You say that claim was settled to avoid litigation, but not acknowledging the validity of any patent; how do you know of your own personal knowledge whether the validity of the patent was acknowledged by the company or not?

A. I don't know that it wasn't by the company, but I know I represented to M'r Stevens the impressions and statements of M'r Lockwood on the subject, and he said in reply, that we had better pay for it, rath er than contest or litigate it.

(What M'r Stevens said objected to.)

558 Cross 13. Has the company the original license under the Tanner brake patent?

A. Yes, sir; I believe they have.

Cross 14. Will you at some early convenient time produce the original of such license for the inspection of the complainant's counsel in this case, and will you also as soon as convenient annex to this deposition a sworn examined copy of such license.

(Objected to.)

A. I will do it if the company will let me have possession of it.

Cross 15. Will you ascertain whether the company will let you have possession of it, and will you so inform the complainant, M'r Thomas Sayles, by letter, addressed to New York, and if so, how soon?

A. I can do it within two weeks, I suppose.

Cross 16. Do you know what was the amount paid M'r Sayles in settling for the use of the Tanner brake?

A. I can say, but not for certainty; I would prefer to answer from reference to our books.

Cross 17. Will you examine the books and send word to the examiner what you find?

A. I will have them examined with the company's consent, and will send word.

Cross 18. When the Tanner brake claim was settled for, did you see M'r Sayles in connection with the matter?

A. Yes, sir; I saw him then, and several times before.

Cross 19. Did you at any time in connection with that settlement, or with any negotiation relating to it, communicate to M'r Sayles any information that the Tanner brake had been in use on the Camden and Amboy Railroad?

A. I do not remember whether I did or not.

Cross 20. Did anybody connected with the company do so in your hearing?

A. Not that I am aware of.

559 Cross 21. Do you remember the use on the Camden and Amboy Railroad of a train-brake, so called, usually styled the McLoughlin brake?

A. Yes, sir; I remember his method of operating the brake; it was in use on the road.

Cross 22. When did it first go in use on the road; upon about how many cars, as near as you can state, was it used, and about how long did it continue in use?

A. I can't say when it went into use on the road. I should say from 1853, 1854, or 1855. For some time, for six or eight months, or a year, it was used experimentally, and was then applied to two or three passenger-trains. I cannot tell how long it continued in use; I should say two or three years, perhaps more.

Cross 23. What kind of trains were those on which it was used?

A. They were the Philadelphia and New York trains, some of them.

Cross 24. They were among the leading trains on the road, were they not?

A. Yes, sir; first-class passenger-trains.

Cross 25. About how many cars per trip would those trains average?

A. The trains varied from three to six and seven cars.

Cross 26. Do you know what form of brake, in respect to the arrangement of levers under the cars, were considered best adapted to be worked by the McLoughlin apparatus?

A. No, sir; I do not.

Cross 27. Did you not own an interest in the McLoughlin patent?

A. No; I think not.

Cross 28. Have you at any time since you have been engaged for the Camden and Amboy Company, known of M'r S. M. Whipple, who is now present, calling upon any officer or person connected with the company, for the purpose of obtaining any information in relation to the use of double brakes, prior to about the spring of the present year?

560 A. I can't say the time, but M'r Whipple did call upon me for information prior to the present year. I don't remember when, I have so many calling upon me.

Cross 29. Is there not present existing among a large number of the railroad companies of the United States an association formed for the purpose of resisting claims made under the Tanner brake patent, and other patents?

(Objected to.)

A. I don't know, sir, except from hearsay.

R. S. VAN RENSSELAER.

Subscribed and sworn to before me this 10th day of September, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to the 12th inst. at eleven a. m.

THURSDAY, *September 12th*, 1867.

Present, counsel as before.

Adjourned to the 13th instant, at 11 a. m.

FRIDAY, *September 13th*, 1867.

Present, counsel as before.

URIAH VAN VOORHIS, called and sworn as a witness on the part of defendant, deposes and says:

Q. What is your name, age, residence, and occupation?

561 A. Uriah Van Voorhis; 51 years of age; reside at 536 Third avenue, New York, and am a conductor on the Third avenue railroad.

Q. 2. Have you been in the employ of the Long Island Railroad Company; if so, when were you employed, what did you do, and when did you leave the employ of said company?

A. I was employed by them on the second of May, 1843. I was yard-master, and had charge of the repairs of cars, and left their employ in 1846.

Q. 3. While so employed, do you know of the application of a double-acting car-brake on that road? If so, state the circumstances connected with such application, and the name of the person who applied to the president of the company for the privilege of applying said brake to a car.

(Objected to on the ground that the matter called for by the question is different from, and additional to, the alleged new matter upon which this case was reopened for further testimony, and upon the ground that the defendants are confined in their taking of testimony, on such re-opening, to the alleged new matter set forth upon their application to reopen; and on the ground that the complainant has had no notice of the alleged matter called for by the question; and on the ground that the answer in this cause does not set the same forth, and has not been so amended as to set it forth; and further objected to as leading.

Defendant's counsel here wishes to note that in the affidavit upon which this case was reopened complainant was notified of a brake known to one Joseph F. Talson and others; the evidence now being taken comes under that head.)

A. I do. In the summer of 1845, M'r George B. Fisk was presi-
562 dent of that road. He sent for me to the office. I went, and he introduced me to a Mr. Stanley, and showed me a drawing of a brake, and he wished me to give M'r Stanley a car to try that brake on. I did so, and M'r Stanley had some of my men to put the brake on.

Q. 4. Will you please give a description of the brake, as then applied, under the direction of said Stanley?

(Objected to as before, and as assuming what has not yet been proved.

The latter clause of the question withdrawn, stopping at the word "applied.")

A. We called it Stanley's double-acting brake, with a lever under the centre of the car, and a rod running from each truck to the centre-lever. There was a rod connected from this lever to the brake-staff, which enabled the brakeman to brake from either brake-staff, and which applied both brakes to both trucks. The reason we called it Stanley's double-acting brake was because the brake applied to both trucks. Formerly we had never used more than one brake to one truck.

(To save time counsel for complainant objects, upon the ground above stated, to all further questions and answers to this Stanley brake.)

Q. 5. You say you left the employ of the Long Island Railroad Company in 1846; how do you know it?

A. Because I went to work on the Harlem Road in April, 1846.

Q. 6. Do you know that N. H. Marshall, Joseph Farrell, and Josiah Phillips were in the employ of the Long Island Railroad Company in the years 1845 and 1846, and do you know of Josiah Phillips having his leg hurt during that time? If so, state what you know.

(Further objected to as leading.)

563 A. I do; once I knew of Josiah Phillips having his leg hurt while in such employ; he worked for me at the time, and I boarded at his house; I know he was hurt in May, 1845; the circumstances I have forgotten; I know he was lame at the time the brake was applied.

Q. 7. Do you know when the Long Island road was opened to Greenport? If so, please state the time.

A. It was on the 24th day of July, 1844.

Cross-examined by M'r Cozzens, subject to the objections heretofore noted.

Cross 8. Do you know where M'r Stanley is now?

A. I do not.

Cross 9. How long since you last saw him?

A. It is many years; I never had but little to do with him.

Cross 10. Do you know where he resided when you last saw him?

A. I do not.

Cross 11. Have you seen him since the time referred to in your second direct answer?

A. I don't know that I have seen him since 1845, to my knowledge; he used to come over during that year to see how the brake operated.

Cross 12. In what manner did this Stanley brake, as you call it, contemplate attaching the centre lever to the car body?

A. There was what we term a hanging strap; it had a hole at each end for attaching it to a couple of beams on the car body, and that strap dropped down three or four inches, and left a space for this lever to work in; the lever was connected to the strap by a bolt, and the strap carried the weight of the lever.

Cross 13. Was the hole in the lever through which the bolt fastening it to the strap went any larger than about enough to permit the lever to turn horizontally on the bolt?

A. No, sir; only a half inch, or a five-eight bolt.

564 Cross 14. Do you mean that the hole in the lever was only big enough to receive a half-inch or a five-eight bolt and allow the lever to turn easily on the bolt, without any more play than would permit this?

A. I do.

Cross 15. What arrangement of rods running from each truck to the centre lever did this brake contemplate?

A. We termed them brake rods; they were straight, plain rods, with a jaw on the end to fit on this centre lever, and these rods run from the centre lever over to the brake levers in the trucks.

Cross 16. What arrangement of levers and rods in the trucks did this brake contemplate?

A. There was an upright lever in the truck, and these brake rods connected the two levers together, the centre lever and the truck lever in each truck.

Cross 17. Did Stanley ever say to you that he had tried any brake on any other railroad than the Long Island Railroad?

A. I don't recollect any conversation of that kind with him, it is so long ago.

Cross 18. Did he ever say anything to you about where he got the brake up, or what he had done with it, or about it, before you saw him?

A. I don't recollect of anything.

Cross 19. Did he speak of it as an experiment he wanted to try?

A. Yes, sir; it was an experiment I had it put on for.

Cross 20. Was it regarded by the people connected with the Long Island road as an experiment?

A. Yes, sir; I think it was.

Cross 21. Did you ever hear Stanley say anything about his having tried a brake on the New Jersey Railroad?

A. I don't recollect of any conversation that passed between us at that time.

Direct resumed by M'r Whipple:

565 Q. 22. You say in answer to the fifteenth cross-question, "We termed them brake rods; they were straight, plain rods, with a jaw on the end to fit on this centre lever, and these rods run from the centre lever to the brake levers in the trucks," and were there or not rods connected with said centre lever running to the windlasses at each end of the car?

A. There were, on each end of the lever running to each end of the car.

Q. 23. Was this Stanley brake which you have described put on the cars of the Long Island road before you left in 1846?

A. Yes, sir.

Q. 24. You say it was first put on as an experiment; was the experiment successful or not?

A. Yes, sir; it was, because we used it on other cars.

Q. 25. Did the said Stanley claim this brake to be his invention or not?

A. I do not remember.

Cross resumed by M'r Cozzens:

Cross 26. Upon how many other cars was this brake put?

A. I don't know, sir; I went back there in 1847, and I put some on after I went back, and some had been put on while I was gone.

Cross 27. What time in 1847 did you go back?

A. The first day of May, 1847; I had been gone just thirteen months.

Cross 28. How do you know that it was put on other cars while you were away?

A. I went back to the same situation, and I found it on cars it was not on when I went away.

Cross 29. Do you know how long before you returned in 1847 it had been put on the cars it was not on when you went away?

A. I do not.

Cross 30. Can you state about how many cars you found it on in 1847 when you returned?

566 A. I don't remember.

Cross 31. Can you say whether it was on more than one car that it was not on when you went away?

A. Yes, sir.

Cross 32. Can you say positively that it was on more than two?

A. I think it was put on four while I was away, but am not positive.

Cross 33. About what was the number of double truck cars for passengers, baggage, express, and mail, on the Long Island road when you returned in 1847?

A. They didn't get any new cars while I was gone, and they had no more when I went back than when I we't away; there were twenty passenger cars and three baggage cars.

Cross 34. Upon how many cars did you put the brake after you returned in 1847?

A. I don't remember; I put them on all that had no double brake on them as fast as we overhauled them.

Cross 35. About how long were you in getting the double brake on them all?

A. I can't answer; as fast as a single brake gave out we put double ones on; I should think it took all of a year to get them all on; it might be a little longer.

Cross 36. Do you think it was inside of a year and a half that you got them all on?

A. I do, sir; we had a new president at about that time, and he was in favor of the double brake, and requested me to put them all on; perhaps it was inside of a year that they all got on.

Cross 37. Did you put them on to freight cars during this time?

A. Yes, sir; as fast as a single brake gave out we put on a double brake.

Cross 38. How many freight cars were there on the road when you returned in 1847?

A. I don't remember; I think we had twenty flat cars with double trucks and ten house-cars.

Cross 39. You say the new president requested you to put these brakes on; did he first speak to you on the subject, or you first speak to him about it?

567 A. I rather think I advanced the idea, as I had a great deal less trouble with double brakes than single ones, and I was in favor of getting them all on.

end for attaching it to a couple of beams on the car body, and that strap dropped down three or four inches, and left a space for this lever to work in; the lever was connected to the strap by a bolt, and the strap carried the weight of the lever.

Cross 13. Was the hole in the lever through which the bolt fastening it to the strap went any larger than about enough to permit the lever to turn horizontally on the bolt?

A. No, sir; only a half inch, or a five-eight bolt.

564 Cross 14. Do you mean that the hole in the lever was only big enough to receive a half-inch or a five-eight bolt and allow the lever to turn easily on the bolt, without any more play than would permit this?

A. I do.

Cross 15. What arrangement of rods running from each truck to the centre lever did this brake contemplate?

A. We termed them brake rods; they were straight, plain rods, with a jaw on the end to fit on this centre lever, and these rods run from the centre lever over to the brake levers in the trucks.

Cross 16. What arrangement of levers and rods in the trucks did this brake contemplate?

A. There was an upright lever in the truck, and these brake rods connected the two levers together, the centre lever and the truck lever in each truck.

Cross 17. Did Stanley ever say to you that he had tried any brake on any other railroad than the Long Island Railroad?

A. I don't recollect any conversation of that kind with him, it is so long ago.

Cross 18. Did he ever say anything to you about where he got the brake up, or what he had done with it, or about it, before you saw him?

A. I don't recollect of anything.

Cross 19. Did he speak of it as an experiment he wanted to try?

A. Yes, sir; it was an experiment I had it put on for.

Cross 20. Was it regarded by the people connected with the Long Island road as an experiment?

A. Yes, sir; I think it was.

Cross 21. Did you ever hear Stanley say anything about his having tried a brake on the New Jersey Railroad?

A. I don't recollect of any conversation that passed between us at that time.

Direct resumed by M'r Whipple:

565 Q. 22. You say in answer to the fifteenth cross-question, "We termed them brake rods; they were straight, plain rods, with a jaw on the end to fit on this centre lever, and these rods run from the centre lever to the brake levers in the trucks," and were there or not rods connected with said centre lever running to the windlasses at each end of the car?

A. There were, on each end of the lever running to each end of the car.

Q. 23. Was this Stanley brake which you have described put on the cars of the Long Island road before you left in 1846?

A. Yes, sir.

Q. 24. You say it was first put on as an experiment; was the experiment successful or not?

A. Yes, sir; it was, because we used it on other cars.

Q. 25. Did the said Stanley claim this brake to be his invention or not?

A. I do not remember.

Cross resumed by M'r Cozzens:

Cross 26. Upon how many other cars was this brake put?

A. I don't know, sir; I went back there in 1847, and I put some on after I went back, and some had been put on while I was gone.

Cross 27. What time in 1847 did you go back?

A. The first day of May, 1847; I had been gone just thirteen months.

Cross 28. How do you know that it was put on other cars while you were away?

A. I went back to the same situation, and I found it on cars it was not on when I went away.

Cross 29. Do you know how long before you returned in 1847 it had been put on the cars it was not on when you went away?

A. I do not.

Cross 30. Can you state about how many cars you found it on in 1847 when you returned?

566 A. I don't remember.

Cross 31. Can you say whether it was on more than one car that it was not on when you went away?

A. Yes, sir.

Cross 32. Can you say positively that it was on more than two?

A. I think it was put on four while I was away, but am not positive.

Cross 33. About what was the number of double truck cars for passengers, baggage, express, and mail, on the Long Island road when you returned in 1847?

A. They didn't get any new cars while I was gone, and they had no more when I went back than when I we't away; there were twenty passenger cars and three baggage cars.

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A. I don't remember; I put them on all that had no double brake on them as fast as we overhauled them.

Cross 35. About how long were you in getting the double brake on them all?

A. I can't answer; as fast as a single brake gave out we put double ones on; I should think it took all of a year to get them all on; it might be a little longer.

Cross 36. Do you think it was inside of a year and a half that you got them all on?

A. I do, sir; we had a new president at about that time, and he was in favor of the double brake, and requested me to put them all on; perhaps it was inside of a year that they all got on.

Cross 37. Did you put them on to freight cars during this time?

A. Yes, sir; as fast as a single brake gave out we put on a double brake.

Cross 38. How many freight cars were there on the road when you returned in 1847?

A. I don't remember; I think we had twenty flat cars with double trucks and ten house-cars.

Cross 39. You say the new president requested you to put these brakes on; did he first speak to you on the subject, or you first speak to him about it?

567 A. I rather think I advanced the idea, as I had a great deal less trouble with double brakes than single ones, and I was in favor of getting them all on.

Cross 40. While you were away from the Long Island road during the thirteen months you have mentioned, had you seen double brakes used anywhere?

A. I do not remember; I had nothing to do with cars while I was away; I was on the track at that time.

Cross 41. Do yo' think that you saw them used on the Harlem road during that time?

A. I am not positive.

Cross 42. Is it possible that you may have done so?

A. I wouldn't say.

Cross 43. Was M'r Fisk, the president in 1845, in favor of double brakes?

A. Yes, sir.

Direct resumed by M'r Whipple:

Q. 44. The witness is now shown Exhibit A, and is asked if the brake on this exhibit is like the one put on the cars of the Long Island road in the years 1845, 1846, and 1847.

A. That is the same principle.

Q. 45. And is the operation the same?

A. Yes, sir.

URIAH VAN VOORHIS.

Subscribed and sworn to before me this 13th September, 1867.

R. E. STILWELL,
Examiner, &c.

568 **JOSEPH FARRELL**, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Joseph Farrell; 49 years of age; reside at 88 Wychoff street, Brooklyn; and am a porter in the chief engineer's store-house department at the navy-yard.

Q. 2. Were you ever in the employ of the Long Island Railroad Company; if so, when, how long, and what did you do while so employed?

A. I was; I commenced in the year 1841 and left in 1856, the first day of December. The first year I went there I was on the repairs of the railroad. In the year 1843 I was put on the train as baggage-master, and continued through up to 1856.

Q. 3. While employed as baggage-master did you know of the use of double brakes on any car or cars of that road; if so, what do you know? Please state of your own knowledge.

A. I did. I know that my baggage-car was taken into the shop for repairs in 1845 or 1846, I can't tell which, and when it came out it had this double-acting brake on it; the wheel on the brake-shaft when screwed up would act on the eight wheels, or the two trucks; before the baggage-car went in to be repaired it had single brakes on, when it came out of the shop the wheel and brake-shaft was placed inside of the car, because when I had to screw up the brake I hadn't to go outside; the rod run from a lever under the centre to the brake.

Q. 4. Do you know of this brake being applied to any passenger-cars on that road; if so, how did it operate?

A. I do; often when I would screw up my brake, in case of danger, inside of the baggage-car, I would run and screw up the passenger-car also, which operated the same as in my baggage-car, on both trucks.

Q. 5. State, if you know, where this brake came from, or was it got up on that road?

A. I always heard that it came from New Jersey.

569 Q. 2. Do you know Josiah Phillips; if so, was he on that road in 1845 and 1846?

A. I do. He was on that road in 1845 and 1846. I knew of his being hurt at about that time; I saw him around on a crutch.

Q. 7. Who had charge of repairing the cars on that road at the time above stated?

A. M'r Van Voorhis.

Q. 8. Was the brake like the one put on your baggage-car and the passenger-car spoken of, put on other cars of that road before you left in 1856, and to what extent?

A. Yes; I should think on all the passenger-cars, and I think there were none without them.

Cross-examined by M'r Cozzens:

Cross 9. How did you get the idea that the brake came from New Jersey?

A. When they were puting it on the cars, the question was asked whose brake was that, or who was putting it on; the answer was that it was a man from New Jersey.

Cross 10. Is that all you know as to how the brake came to get on the Long Island road?

A. That is all I know; I never made any further inquiries.

Cross 11. You say they put that brake on all the passenger-cars; did they put it on the freight cars also?

A. They put it on all passenger and baggage and all the eight-wheel freight-cars, I think; I won't say positive.

Cross 12. About how early did they get it on all the freight-cars?

A. Between 1845 and 1855, I should think.

Cross 13. Was it on all the freight-cars as early as 1849?

A. That I can't say.

Cross 14. Was it on all or most of the freight-cars as early as 1850?

570 A. I can't say positive whether it was or not.

JOSEPH FARRELL.

Subscribed and sworn to before me this 13th September, 1867.

R. E. STILWELL,
Examiner, &c.

JOSIAH PHILLIPS, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Josiah Phillips; 53 years of age; reside at East New York, Long Island, and am a carpenter.

Q. 2. Have you been in the employ of the Long Island Railroad Company; if so, when did you begin, and when did you leave the employ of said company, and what did you do while so employed?

A. I have. I began in the spring of 1843 and left in 1848; I was carpenter, brakeman, baggage-master, and conductor.

Q. 3. While so employed do you know of the use of double brakes on the cars of that road? If so, state what you know, and give the particulars, and how you fix the date of such knowledge.

A. I do; I know they were put on in 1845, in June or July; the brakes acted on the cars so that they broke up eight wheels; the brakes worked under the cars by means of rods attached to a brake, and by turning the brake you broke up the whole car. This could be done from

either end. I fix the date of their being put on by my being hurt, which was on the 1st of May, 1845. I was hurt on the leg, and I was laid up about a month before I got out; when I did get out, I was on my crutches
down in the yard of the company; I saw them at work putting
571 on that brake; I sat down there; I stayed there about an hour
or so, and then went back again into the house.

Q. 4. Was this double brake applied to any other car or cars on that road before you left in 1848? If so, please state what you know of their application, and to what extent were they applied.

A. They were; they were applied to the cars as fast as the other cars got out of order.

Q. 5. Who had charge of the cars and repairs in 1845 and 1846 on that road?

A. Uriah Van Voorhis.

Q. 6. Was Joseph Farrell in the employ of the company at that time?

A. Yes, sir.

Q. 7. Do you know whether this double brake was got up on that road or not?

A. I think not; it came from New Jersey.

Cross-examined by M'r Cozzens:

Cross 8. What did you ever know, or what did you hear, of this brake coming from New Jersey?

A. I heard them say so when the men were putting it on.

Cross 9. What did they say about it?

A. They said it was another Jersey pattern.

Cross 10. Is that all you heard about it?

A. Yes, sir.

Cross 11. Did you hear the name of any person as the getter up of the brake?

A. No, sir; not to my knowledge.

Cross 12. You say you know the brake was put on in June or July, 1845; is your being hurt, as you say, the only way you have of fixing this time?

A. Yes, sir.

Cross 13. In the year 1845, what were you doing on the road?

A. I was baggage-master and brakeman on the car.

Cross 14. How did you get hurt?
572 A. Stowing away stoves up in a car; one fell down and struck
me on my leg.

Cross 15. Can you say that a double brake was applied to more than one car in June and July, 1845?

A. Yes, sir.

Cross 16. How many more?

A. Half a dozen more.

JOSIAH PHILLIPS.

Subscribed and sworn to before me this 13th September, 1867.

R. E. STILWELL,
Examiner, &c.

NATHANIEL H. MARSHALL, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Nathaniel H. Marshall; 57 years of age; reside at Oyster Bay, Long Island, and I am a railroad-track layer.

Q. 2. Have you been in the employ of the Long Island Railroad Company; if so, when, how long, and what did you do while so employed?

A. I have been in their employ between 1837 and 1838; I commenced with them, and remained until about 1850. I built the track, superintended and laid the road from Jamaica towards Hicksville; after we got the track built to Hicksville, we run to Hicksville until 1844. I was employed and had charge of the yard at Hicksville; after that we had a new president, George B. Fisk; some time in July, 1844, the cars commenced to run to Greenpoint. I then took the position of agent for the purchase of wood, and paid the men off, at all the points east of
573 Jamaica, and had charge of all of the stations east of Jamaica, and also held that position until I left.

Q. 3. While so employed did you know of the use of double brakes on the cars of that road? and, if so, please state of your own knowledge, and also give the time when you first saw such brakes in use.

A. I did know of the use of double brakes on that road in 1845; I should think not far from May; there was a car fixed with these brakes on it, which they had taken the other brakes off of, I think, and put these on to try them; it came out to one of the stations, when I was at Hicksville, I think. The old brakes used to operate on only one set of wheels, on only one truck—that is, the single brake; this new brake operated on both trucks from one end, and operated on the other end the same.

Q. 4. Have you any further knowledge of the use of this brake on that road before you left? If so, please state it.

A. Yes, sir; as fast as they fixed the cars they put on this brake.

Q. 5. Did you, in 1845, know Uriah Van Voorhis; if so, what was his business on that road?

A. I did; he was yard-master of Brooklyn, and had charge of all the cars; he overhauled them all, and see that they were sent out on time on the road; he attended to all the repairing of the cars.

Q. 6. Did you know M'r Josiah Phillips, and also Joseph Farrell, as employees of the Long Island Railroad Company in the years 1845 and 1846 and thereafter?

A. Yes, sir.

Cross-examined by M'r Cozzens:

Cross 7. What makes you think it was not far from May, 1845?

A. Well, what makes me think so is that I knew M'r Phillips hurt his leg, and that he was lame at that time and wore his crutch.

Cross 8. Have you heard M'r Phillips say that he was hurt about May, 1845?

574 A. Well, I heard him say here; he swore to it, and I couldn't help hearing him.

Cross 9. Had you heard him say so before he swore to it here?

A. I don't know that I did.

Cross 10. Do you know of your own knowledge that M'r Phillips was hurt in 1845?

A. Yes, sir; I do.

Cross 11. How do you know it?

A. I know, because I was on the road working with him, and saw him pretty much every day, and know when he was hurt.

Cross 12. How does this enable you to fix the time when he was hurt?

A. Well, I fix the time when he was hurt because it was not a great while from the time M'r Van Voorhis left; M'r Van Voorhis left shortly after; it was the same year, I think.

Cross 13. How soon after was it that M'r Van Voorhis left?

A. I could not tell to save my life the day and date; I can tell the year, but not the time in the year.

Cross 14. Was it a month after?

A. Well, I don't know, sir; I should think it was more than that.

Cross 15. How much more? State as nearly as you can.

A. I could not tell; I know he left shortly after M'r Phillips hurt himself.

Cross 16. What is your idea of shortly after?

A. Well, it might be four, five, or six months.

Cross. 17. Do you think it was within six months?

A. Well, I think it was.

Cross 18. Was the putting on of this brake at the time you mentioned in 1845 considered an experiment?

A. Yes, sir.

Cross 19. Do you know whose plan this brake was?

A. No, sir; I do not, only what I heard say.

Cross 20. What did you hear said about it?

A. I was on the road at work when I saw the car come up with
575 the new brake on it; I didn't see it put on; I wasn't down to the
shop; I heard the men as they came up on the road say that they
had got the new brake on; they told at the time who the man was who
brought it there; I think his name was Stanley.

Cross 21. Have you any other way of fixing the time you have testified to than what you have stated?

A. Well, I don't know as I have.

N. H. MARSHALL.

Subscribed and sworn to before me this 13th September, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to the 18th inst., at 11 a. m.

WEDNESDAY, *September 8th*, 1867.

Present, counsel for the respective parties.

FREDERICK BOYES, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Frederick Boyes; sixty-two years of age; reside in Jersey City, New Jersey; am a bookkeeper, at present employed by Robert Baile, gold broker, 27 Wall street, New York.

Q. 2. Have you been in the employ of the New Jersey Railroad and Transportation Company; if so, when, how long, and what did you do when so employed?

A. I have been; I commenced with them in 1839, and remained
576 with them till 1852; I was engaged as machine-shop clerk; I was
bookkeeper; I was purchasing agent, and had the keeping of the
time of the men in the shop, of both car and machine shops.

Q. 3. While so employed, did you know a man by the name of Stanley; if so, did he have an account with the company; if so, what was it about, what was the amount, when did it begin, and when terminate?

A. I did know a man by the name of Isaac Newton Stanley; he had an account with the company; I had instructions from M'r Schuyler, vice-president of the company, to open an account with him for work that he might want done in the shop; the account was for car-trucks; that is, for the wood and wrought-iron work; the amount was $234.22; it commenced on the 24th of September, 1842, and closed on the 28th of December, of the same year; the entries of said work and materials were made in the said company's books by me in my own handwriting.

Q. 4. During the time said Stanley was having this work done on said car-trucks, did he apply a brake to a car of the said New Jersey Railroad and Transportation Company? If so, state what you know about it.

A. He did apply a brake, but I don't know what kind of brake.

Q. 5. Have you examined the time-book and pay-rolls of the said company; if so, do you find the name' of Bernard Hughes, Moses Parcels, Erastus Reid, and Joseph F. Talson on said time-book and pay-rolls of said railroad company in the year 1842?

A. I have examined them, and find their names there, and know of my own knowledge that they were in the employ of the company before this time and afterwards; I made out the pay-rolls for the company.

Q. 6. Do you know who was foreman of the car department of said company in the year 1842?

A. I do; it was Joseph F. Talson.

Q. 7. Do you know when M'r Talson left the employ of the New Jersey Railroad and Transportation Company? If so, please state what you know.

577 A. I left the company in 1852, and M'r Talson left some time before that; I know he was there several years after the Stanley brake was applied.

Adjourned to the 19th inst. at 11 a. m.

FREDERICK BOYES.

Subscribed and sworn to before me this 19th day of September, 1867.

R. E. STILWELL,
Examiner, &c.

THURSDAY, *September 19th*, 1867.

Present, counsel as before.

JOHN H. JOBES, recalled on the part of defendant, deposes and says:

Q. 1. In your direct examination, August 8, 1867, in answer to the sixth question relating to a double brake on a car of the Camden and Amboy Railroad, you say: "I got under the car to see this brake; I had never seen one of the kind, or one work before, and I was anxious to see the movement of the brake;" have you any knowledge of a double brake being used on a car of the New Jersey Railroad and Transportation Company after this; if so, please state what you know, and any particulars connected with such knowledge.

A. I do know that during M'r Talson's time I was then brakeman on the Newark train; I was transferred to the Philadelphia train; I there found a double-acting brake upon a flat car; I mean by a double-acting brake, one with a centre-lever acting upon eight wheels at once; I used that brake on the Philadelphia line; I used it probably two or three years; I can't state the exact length of time.

578 Q. 2. Can you state the time more definitely than that it was in M'r Talson's time.

A. I can't any further than that it was in M'r Talson's time.

Cross-examined by M'r Sayles, the complainant, in person:

Cross 3. Do you recollect operating the brake on the New Jersey Railroad and Transportation Company's car for some two or three years, as you have just stated, as distinctly as you recollect the brake on the Camden and Amboy car, as you testified in this case on the 8th of August last?

A. I do.

Cross 4. Was Joseph F. Talson superintendent of car repairs on the New Jersey Railroad and Transportation Company's road when this brake of which you speak was used on one of the cars of that road?

A. He was.

Cross 5. Do you think that Joseph F. Talson would be more likely to recollect how long the said brake of which you speak, as put on the New Jersey Railroad and Transportation Company's car, was used than you do?

A. I think he would, rather.

JOHN H. JOBES.

Subscribed and sworn to before me this 19th September, 1867.

R. E. STILWELL,
Examiner, &c.

GEORGE OSMAN, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

579 A. George Osman; 43 years of age; reside in Brooklyn, Long Island. I am working in a car-shop of a horse railroad, in Brooklyn.

Q. 2. Have you at any time been in the employ of the Long Island Railroad Company; if so, when were you so employed, what did you do, and when did you leave the employ of the company?

A. I have; I commenced in 1848, and left them about six years ago, as near as I can remember; I was brakeman while in their employ.

Q. 3. How do you fix the time of going into the employ of said company, which you say was in 1848?

A. I came from England in 1847, and went in their employ the next year.

Q. 4. While employed as brakeman, to wit, in 1848, do you know of the use of double-acting brakes on that road? If so, please state what you know.

A. I do; the first I saw of it was on a baggage car, what they call a centre lever; the windlass for applying the brake was inside of the door; there were two or three passenger cars had the same kind of brakes on; some time after I was there, can't say how long, they were taken off and changed, and some other kind of brake put on in their place.

Q. 5. What kind; can you give some description?

A. There was a lever on each end of the truck, with a long rod under the car. This rod was formed of two rods, and a small chain connected these two rods, to take them up shorter as they were worn out, and there was a rod connecting these two levers in the truck, which rod run across the truck, then a chain from one end of the outside of these levers to the spindle. It had in all four levers; that is, two upright levers in each truck. This form of brake, I believe, is called the Stevens brake. Before this Stevens brake was put on these cars there was a brake put on with two cross levers under the car, which levers were suspended on links, so as to swing to and fro; this brake, I believe, is called the

Hodge brake; and these two brakes were put on after I went there, in the place of the centre lever brake, which I found on the cars when I went there in 1848.

580 Q. 6. Witness is now shown Exhibit A, and asked, referring to the brake, what it represents?

A. That represents the brake which was on the baggage car, and some of the passenger cars, when I went there in 1848.

Q. 7. While brakeman on that road, did you have occasion, while out on the road, to fix up these different kinds of brakes which you have described? If so, state anything which may occur to you bearing on this matter inquired of.

A. I did, sometimes, when I was on the road, have to take off the levers; they would get broken or worn off; sometimes the bolts would lose their nuts, and we would have to take the rods down; sometimes we would have to tie up the lever with ropes; when we got to the end of the read we would take it in the shop and have it fixed.

Cross-examined by Mr. Cozzens:

Cross 8. What time in 1848, as nearly as you can state, did you commence your employment with the Long Island Railroad Company?

A. In the month of August.

Cross 9. Was the centre lever of the brake which you say you first saw on the baggage car attached to the car in the same manner as in Exhibit A; that is, by being fulcrumed on a rigid bolt so that it could turn horizontally on the bolt without moving backwards or forwards when it turned?

A. Yes; there was no swing to it.

Cross 10. You say two or three passenger cars had it on in 1848, when you first saw it. Did any more passenger cars than those two or three have it on at that time?

A. I don't know how many there was; there were two or three, and there may have been more; that is all I saw.

Cross 11. Do you know how many passenger cars there were on the road in 1848?

A. No, sir, I do not; there might be ten or a dozen.

581 Cross 12. To your best recollection, how long was it after you first saw the brake with the single centre lever that said brakes were taken off and the other kind put on?

A. I couldn't say exactly, it might be five or six years; to the best of my recollection it was five or six years, or it might be less; because I know at one time there was a good deal of change in taking off and putting on brakes.

Cross 13. Do you think it was five or six years?

A. Well, I do.

Cross 14. Are you sure that this single centre lever brake was on any passenger cars in 1848—may it not have been only on baggage cars?

A. Yes, sir; there was some on some of the passenger cars.

Cross 15. Did the windlass come up inside on the passenger cars?

A. No, sir.

Cross 16. Can you state the number of any of the passenger cars upon which it was in 1848?

A. No, sir.

Cross 17. What trains did any of these passenger cars run in?

A. I couldn't tell you.

Cross 18. Was the brake on these two or three passenger cars changed to either of the other forms of brakes you have mentioned?

A. I couldn't say whether they were all changed or not, or whether any of them were changed. I think they were all changed.

Cross 19. How long after were they changed?

A. I couldn't say.

Cross 20. How many baggage cars was this single centre lever brake on in 1848?

A. I think there were two mail cars the same as Exhibit A; they were baggage cars.

Cross 21. Had brakes like Exhibit A been put on all the passenger cars before any of the passenger cars were changed to the Hodge or Stevens brake?

A. Not all of them.

582 Cross 22. What kind of brake was on those which had not brakes like Exhibit A when the change to the Hodge or Stevens was made?

A. They had single brakes on to brake at one end of the car.

Cross 23. Were there any brakes like Exhibit A put on the freight cars?

A. I don't know.

Cross 24. Were any of those passenger cars which had, as you say, brakes like Exhibit A, in 1848, on the road when you left it?

A. I don't know, sir.

Cross 25. While you were brakeman what train did you run on?

A. It would be impossible for me to tell. Sometimes I ran to Farmingdale, sometimes to Greenport, sometimes to Yaphank, and sometimes to Suffolk Station.

Cross 26. When you left the road did any of the passenger cars have on them the brakes which you say you saw in 1848?

A. I don't know, sir.

Cross 27. By the time you left the road had all the brakes of the passenger cars been changed to either the Hodge or Stevens?

A. I believe I have answered that question two or three times. They were not all changed by them, some had single brakes.

Cross 28. Did any of them have on brakes similar to those which you say you saw in 1848?

A. No, sir.

Direct resumed, by M'r Whipple:

Q. 29. While on that road did you know Uriah Van Voorhis; if so, what did he do?

A. I did; he was boss of repair shop at South Ferry Depot, in Brooklyn, on the Long Island Railroad.

Q. 30. And did you know Joseph Farrell; if so, what did he do?

A. I did; he was baggage master.

583 Q. 31. Do you recollect what kind of a brake was on the baggage car which he run?

A. Yes, sir; it was the same kind as on Exhibit A, which was called the centre lever.

Cross resumed by M'r Cozzens:

Cross 32. What duties did Van Voorhis have to perform as boss of the repair-shop, as you have stated?

A. To take charge of the men and look after repairs of the cars; if any of the brakes broke to fix them, or to do any other repairs that came up. The principal shop for repairing was at Jamaica.

his
GEORGE + OSMAN.
mark.

Subscribed and sworn to before me this 19th day of September, 1867.
R. E. STILWELL,
Examiner, &c.

Adjourned to 11 a. m., the 20th instant.

FRIDAY, *September 20th*, 1867.

Present, counsel for the respective parties.

JAMES S. GAMBLE, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

584 **A. James S. Gamble; 55 years of age; reside at Newark, New Jersey, and am in the auction and commission business.**

Q. 2. Have you been in the employ of the New Jersey Railroad and Transportation Company? If so, when, and in what capacity, when did you commence, and when leave?

A. I have been in their employ; I am not certain whether it was in April, 1837, or April, 1838; it was one of those years; I left in 1847 or 1848; I can't fix the date; I was there ten years, lacking a few days; I was a conductor on the Philadelphia train; first on the Newark train, and then on the Philadelphia train, where I was when I left.

Q. 3. While conductor on the Philadelphia line, did you know of the use of a double-acting brake on any car or cars run in that line? If so, please state what you know, and any circumstance, if any, connected with such knowledge?

A. I did. As near as I can recollect, this double-acting brake was applied some three years before I left the road; and, as far as my knowledge extends, was on the road when I left. The operation of that brake was different from the one we formerly had used, inasmuch as it broke upon both trucks at once, and from either end of the car, and upon all the wheels.

Q. 4. What kind of a brake did you formerly use, that you speak of?

A. It was called a single-acting brake, brakeing only upon one truck.

Q. 5. Who was your brakeman at that time?

A. John H. Jobes.

Q. 6. Who applied this brake to the car running in said Philadelphia line?

A. M'r Joseph Talson.

Q. 7. What position did he occupy on that road?

A. He was foreman of the car-shop, and superintendent of repairs.

Q. 8. Was he so employed during the whole time that you were in the employ of the company?

A. He was.

585 **Cross-examined by M'r Cozzens:**

Cross 9. I understand you to mean that it may have been in 1848 that you left the employ of the New Jersey Railroad and Transportation Company?

A. Upon reflection, I think it must have been in 1847; and according to my best recollection, it was in that year.

Cross 10. Please state, to the best of your recollection, what month in 1847 it was that you left?

A. I left the 1st of September, and it must have been nine years and some months that I was in their employ.

Cross 11. When you first commenced your employment with said railroad what did you do?

A. I was conductor.

Cross 12. Were you, then, conductor during the whole time that you were in their employment?

A. I was.

Cross 13. You say you were conductor, first, on the Newark train. This train ran from Jersey City to Newark and back, did it not?

A. Yes; I also made one trip a day from Jersey City to New Brunswick and back.

Cross 14. What kind of a train was it on which you made the trip from Jersey City to New Brunswick and back, each day?

A. A passenger train.

Cross 15. Was it a through Philadelphia train?

A. No; there was no Philadelphia trains running then.

Cross 16. Was it a mail train?

A. Yes, sir.

Cross 17. Do you remember what time in the day it left Jersey City?

A. It left New York at nine o'clock, and Jersey City at about a quarter past nine.

Cross 18. At the time you were speaking of, when passengers desired to go from New York to Philadelphia, by what railroad did they go?

A. Camden and Amboy, taking boat from New York.

Cross 19. Was this the only way they could go, at this time, by railroad to Philadelphia?

586 A. This was the way when I first went on the road.

Cross 20. About what time, to the best of your recollection, was there railroad communication established beyond New Brunswick, so that passengers could go from New York to Philadelphia all the way by railroad, starting from Jersey City?

A. The first of January, 1838 or 1839, to the best of my recollection.

Cross 21. How long were you conductor on this Newark train you have spoken of?

A. It was about five and a half years.

Cross 22. How long did you continue to make those daily trips from Jersey City to New Brunswick and back.

A. Until I took charge of the Philadelphia train.

Cross 23. After you took charge of the Philadelphia train, did you continue on it until you left the employ of the road?

A. I did.

Cross 24. What kind of brakes were used on the Newark train and the train you spoke of, from Jersey City to New Brunswick?

A. They were single-acting brakes, breaking only upon one truck, with the brake applied between the two wheels.

Cross 25. Were there none of the cars in either of those trains which had any other than the single brakes?

A. They all had single brakes, to the best of my knowledge.

Cross 26. You say, to the best of your knowledge; do you think there is any doubt about it?

A. I do not.

Cross 27. About how many cars did those Newark trains average?

A. When I first went on the road, the cars were four-wheeled cars, and sometime' had twenty in a train; after we got to using long cars, the Newark train would average three or four cars, and the Brunswick train five or six.

Cross 28. Were these Newark and New Brunswick trains what would be called first-class trains?

A. Yes, sir.

587 Cross 29. How many cars did what you have called the Philadelphia train average during the time that you had charge of it?

A. One platform-car and five passenger-cars.

Cross 30. That, I suppose, was a first-class train, was it not?

A. Yes, sir.

Cross 31. You say that while you were a conductor on that train you knew of the use of a double-acting brake; please state how that brake was constructed.

A. There was a lever in the centre under the platform car to which it was applied, with a rod running to and connecting with the brakes on the trucks at each end, and connected with a windlass at the same time. I know the operation was by the application of the windlass; the brakes bore upon all the wheels of the trucks.

Cross 32. How do you know that this was the manner in which the brake operated?

A. By personal observation.

Cross 33. Did you ever operate it yourself?

A. I can't say positively that I ever did, but I saw it operated by my brakeman.

Cross 34. How was that brake constructed and arranged in the trucks?

A. I can't answer that question; I never examined the mechanical construction of it.

Cross 35. Upon how many cars of that Philadelphia line was such a brake as this used?

A. But one to my knowledge; that was a platform car, upon which the crates carrying the baggage were carried.

Cross 36. The car was sometimes called a crate-car, was it not?

A. Well, we generally called them platform cars; some might have called them crate-cars.

Cross 37. What kind of brakes did the cars of this Philadelphia line, other than the platform cars, have?

A. The brakes bore only on the wheels of one truck; they were what we call single brakes.

Cross 38. From what place to what place did this Philadelphia line run while you were conductor on it?

588 A. From Jersey City to New Brunswick, and from New Brunswick beyond; part of the time to Camden, and part of the time to Taconey, and part of the time to Kensington.

Cross 39. What time in the day did that line leave Jersey City?

A. About quarter past nine in the morning?

Cross 40. Did you run on it beyond New Brunswick?

A. No, sir.

Cross 41. Do you know about what time that train would be due at Trenton?

A. About twelve o'clock.

Cross 42. Might it have been about half past eleven?

A. I hardly think that; it might have been quarter to twelve.

Cross 43. Do you know whether any train was run to meet your Philadelphia line at Trenton?

A. No, sir; I know there was not; Princeton was about the meeting-place.

Cross 44. I do not mean the other mail line passing it or meeting it; I mean a train running to connect with it at Trenton.

A. I can't answer that question definitely.

Cross 45. Was that double brake on that platform car the first brake of that kind which was used on the New Jersey R. R. & T. Company's road?

A. The first to my knowledge.

Cross 46. Was it the only one of that kind which was used on any of the through lines from New York to Philadelphia during the time you ran the Philadelphia line spoken of?

A. It was the only one to which my attention was particularly called; why I say particularly is that my brakeman, M'r Jobes, called my attention to it, and said it was a very desirable brake, and worked nicely; it was something new.

Cross 47. Was your attention ever called particularly, or in any other way, to any other brake of the kind, or any of the other through trains from New York to Philadelphia?

A. No, sir.

589 Cross 48. If there had been any other brake of the kind on any of the other trains from New York to Philadelphia during the time you run the Philadelphia line spoken of would you have been likely to know of it?

A. Not certainly; there might have been a brake on the Camden and Amboy road which I would know nothing of; but if it had been on any line belonging to the New Jersey Railroad and Transportation Company I should have known of it.

Cross 49. If there had been such a brake on any of the lines between New York and Philadelphia which ran over the New Jersey Railroad and Transportation Company's road during the time you were conductor on that road would you have known of it?

A. I think I would.

Cross 50. Have you any doubt that you would?

A. It is possible that I would not; I have a doubt whether I would know it positively.

Cross 51. If there had been such a brake on any of these through trains from New York to Philadelphia running over the New Jersey Railroad and Transportation Company's road while you were running the Philadelphia line spoken of would you have known of it?

A. I might possibly have not known of it, for they might possibly have applied brakes on the other end of the road that I knew nothing of; I speak of cars that were built in our shops.

Cross 52. You say you might possibly not have known of it; do you think you would have known of it?

A. No, sir; not certainly.

Cross 53. You say "they might have applied brakes at the other end of the road that you knew nothing of;" did not cars running in the through lines between Philadelphia and New York, and built at what you call the other end of the road, run over the New Jersey Railroad and Transportation Company's road while you ran as conductor on the Philadelphia line spoken of?

A. They did.

Cross 54. Did not some of such cars run in the Philadelphia line of which you were conductor?

A. Undoubtedly.

590 Cross 55. Now, if there had been such a brake on any of these cars built "at the other end of the road," and running in those through trains from Philadelphia to New York over the New Jersey Railroad and Transportation Company's road while you were conductor on the Philadelphia line aforesaid, would you not have been likely to know it?

A. Not necessarily; I might not have known of it.

Cross 56. You never heard of such a thing, did you?

A. No, sir; my attention was never called to any other double brake except the one on the platform-car spoken of.

Cross 57. At what shop was the platform-car fitted with the brake spoken of?

A. At the shop of the New Jersey Railroad and Transportation Company at Jersey City.

Cross 58. You say that, so far as your knowledge extends, this brake was on the road when you left, and that it had been applied some three years before you left; do you mean that it was in use the whole of that three years?

A. I do, to the best of my knowledge.

Cross 59. How sure do you feel of this?

A. I feel quite confident of it.

Cross 60. Do you think you may not be mistaken about it?

A. I think not; I should have known if it had been taken off.

Cross 61. Do you feel as positive as to the other things you have testified about as you do of this?

A. I think I do.

Cross 62. Do you think that M'r Talson would be likely to recollect how long this brake was used?

A. I should think he would.

Cross 63. Would he be likely to recollect how long it was used as well as or better than you do?

A. I think he would better, as he was foreman of the shop and had charge of the repairs, and would be more likely to know.

Cross 64. You say Jobes called your attention to this brake on the
platform-car as a desirable thing, and you say it was "something
591 new"; was there any talk among the hands on the New Jersey
road or on your train about it?

A. No, sir; not to my knowledge.

Cross 65. Did you hear any body speak of it except Jobes?

A. Not at that time; I might have heard people remark that it was a good brake; subsequently, no doubt, I did. I considered the brake a good one, and no doubt talked about it to this one and that one.

Cross 66. You say you might have heard people remark about it; did you hear them?

A. I have no doubt I did.

Cross 67. How long after the brake was put on the platform car did you hear people remark about it?

A. Shortly after; about the time.

Cross 68. Had you ever heard of such a brake before this one was put on the platform-car?

A. No, sir.

Cross 69. If such a brake had been used upon any considerable number of cars built at the Camden and Amboy Company's shops, which ran in the through trains between New York and Philadelphia, passing over the New Jersey Railroad and Transportation Company's road while you were conductor on the Philadelphia line you have mentioned, would you have known of it?

A. Not certainly.

Cross 70. Do you think you would have known of it?

A. I can only give the same answer—not certainly.

Cross 71. Do you mean to say that if a considerable number of such cars as are referred to in the 69th question had been running daily for years, during the time that you were conductor of the Philadelphia line, you would not have known of it?

A. I mean to say that I might not have known of it?

Cross 72. Would you not have been likely to know it?

A. Not necessarily.

Cross 73. You never heard of it, did you?

A. No, sir; if I had, I should have known of it. I speak to the best of my knowledge.

592 Cross 74. When, as you say, people remarked about this brake, they spoke of no other one, did they?

A. No, sir; the conversation referred to that brake.

Cross 75. Did any of those people speak of ever before having seen or heard of any such brake?

A. I don't think they did.

Cross 76. Was it spoken of as Talson's brake?

A. No, sir.

Cross 77. Was the name of Stanley spoken of in any way in connection with it?

A. I think not.

Cross 78. Did the people whom you heard remark about it speak of it as a new thing?

A. It was so considered.

Direct resumed:

Q. 79. Is there any doubt in your mind, or not, as to whether there was a double brake on the platform-car of that road which operated from either end of the car, and in use on said road while you were conductor on said Philadelphia train?

A. There is no doubt at all.

JAMES S. GAMBLE.

Subscribed and sworn to before me this 20th day of September, 1867.

R. E. STILWELL,
Examiner, &c.

Bernard Hughes, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

593 A. Bernard Hughes; fifty-one years of age; reside at Jersey City, and am drill-master of trains of the New Jersey Railroad and Transportation Company, and have been so ever since 1849, but have been employed by the company since 1836.

Q. 2. How were you employed before being appointed drill-master?

A. On repairs of cars.

Q. 3. While so employed, did you know one Isaac Newton Stanley; if so, what are the circumstances connected with such knowledge?

A. Yes, sir, I knew him; he came there to apply a brake. I presume he was authorized by the superintendent of the road, George or Robert Schuyler, to try to apply this brake of M'r Stanley's, and M'r Stanley went to work and put the brake on under an eight-wheel platform-car, and in putting it in operation we took and tried the car up the road. Five or six men ran the car up the track ways, and then run the car down the track with all the force we could give it, and I won't be positive whether M'r Stanley was on the ground or on the car watching the brake to see how it applied to the wheels, but some one was; the result was that that was about the last of M'r Stanley's construction. The brake was applied, and the constructions were so light that the brake broke all to pieces; they were wire or string, I don't know which, a little of both.

Q. 4. Well, what kind of a brake did M'r Stanley try to construct; please explain?

A. He wanted to construct a brake that would brake upon eight wheels instead of four, and from either end of the car.

Q. 5. Well, after M'r Stanley gave up, what more was done with regard to this brake you have just described?

A. M'r Talson went to work and put on a brake similar to that, only put it on more substantial and on a platform car; the car was put on the Philadelphia line.

Q. 6. Was the brake on this platform-car put to service on that road? If so, state what you know about it.

A. It was put to service on that road, and I know it worked well and answered a good purpose.

594 Q. 7. About what time was the brake applied; that is, the year, and how do you fix the time?

A. Well, I think it was in the neighborhood of 1842 or 1843. I went to Wisconsin in 1842, in June, and returned in July, and I think that brake was put on in the fall following, if I am not mistaken.

Cross-examined by M'r Cozzens:

Cross 8. The brake which Stanley put on was only applied to one car, was it?

A. Yes, sir.

Cross 9. As Stanley put it on, was it a failure and abandoned?

A. Yes, sir.

Cross 10. As he put it on, how long did it stay on the car?

A. I don't think it stayed on any length of time at all, for I think we had to take it off to use the car.

Cross 11. What led the road to have Stanley try this experiment, if you know?

A. Well, I think the cause of them thus trying that brake was because they wanted to get the pressure on more wheels than they could on the brake they were using at that time, which only applied to four wheels.

Cross 12. When they took off the Stanley brake, what kind of brake did they leave on that platform-car?

A. The same brake that was on it.

Cross 13. Was the brake that was on it a single brake?

A. Yes, sir.

Cross 14. Did you yourself see this Stanley experiment tried?

A. I did.

Cross 15. After that experiment failed, what became of M'r Stanley, if you know?

A. I do not know; I don't know that I ever saw him after that.

Cross 16. Can you describe the construction and arrangement of the brake tried by Stanley?

595 A. Yes, sir; it was a brake with a lever in the centre of the car, and a rod running from one end of the lever to one end of the car, and reversed to the other end of the car; the brake was applied to the outside of the wheels instead of the inside.

Cross 17. To what, if anything, did these rods running from the end of the lever to the ends of the car connect?

A. They connected with a rod down through the platform of the car; it was the brake-staff.

Cross 18. By what means was the power applied from this lever in the centre of the car to the brakes?

A. It was by a connection of a chain and hook to a lever in each truck; the connection went from the centre lever.

Cross 19. Did that connection go from the extreme end of that centre lever, or from a little inside of the end?

A. A little inside of the end.

Cross 20. Was there a hook at each end of the chain to hook it to the lever in the truck, and to the centre lever?

A. Yes, sir.

Cross 21. How was the brake arranged in the truck so as to apply power from one side of the truck to the other side of the same truck?

A. It was done by an eyebolt passing through the centre of the brake-beam, with which was connected a rod running across the truck to the upright lever in the truck.

Cross 22. Are you positive that this is the way in which the brake was arranged?

A. Yes, sir; as near as I can come at it.

Cross 23. Are you positive that you have described its arrangement in the truck just as it was?

A. I am, as near as I can recollect.

Cross 24. Do you feel sure that you recollect it correctly?

A. Yes, sir, as near as I can recollect.

Cross 25. Do you think that you are at all mistaken about it?

A. I don't think I am.

Cross 26. Are you sure that the brakes were applied to the outside of the wheels, and not to the inside?

A. I am.

596 Cross 27. How long after this Stanley experiment was tried was it that, as you say, "M'r Talson went to work and put on a brake similar"?

A. I can't say; it was some time after.

Cross 28. Was it in the same year?

A. I could not say; I don't hardly think it was in the same year.

Cross 29. Was it within a year afterward?

A. I couldn't say whether it was or not.

Cross 30. Was it within two years afterwards?

A. I was just going to make a suggestion that we were very anxious to get clear of the brakes we had; it was in that light that the experiment was tried to get rid of the damage those brakes were doing. I could not say whether it was within two years; it might be, and it might be more.

Cross 31. Can you mention any time after within which it was?

A. No, sir; I cannot.

Cross 32. Was it before 1848?

A. Well, I think we had that brake in operation before that.

Cross 33. Can you give us some idea how long before that you think you had it in operation?

A. I could not; I could not come to no definite time.

Cross 34. How long, to the best of your recollection, was that brake kept in use after Talson put it on, as you say?

A. A good while—a long while; it was kept on for several years.

Cross 35. How was it constructed?

A. I have stated before.

Cross 36. Do you mean that as Talson put it on it was constructed and arranged as it was, when, as you say, Stanley tried it?

A. Yes, sir; it was a similar thing exactly.

Cross 37. After Stanley put it on, was it applied to more than one car?

A. I think it was.

Cross 38. How positive are you of this?

597 A. I am positive that it was put on more than one car.

Cross 39. How many more than one car?

A. I couldn't say how many more; cars were very few in those days.

Cross 40. Was it applied to a good portion of the cars?

A. Well, yes, sir; it was applied mostly to the passenger-cars of the Philadelphia train.

Cross 41. About how long after Talson, as you say, put the brake on was it applied to these other cars?

A. It might have been some time after it was put on the platform-car; we were building cars then, and I think it was put on the cars as they came out of the shop.

Cross 42. Would it have been within a few months after it was put on the platform-car?

A. It might have been.

Cross 43. Were you building new cars at the time Talson put the brake on the platform-car?

A. Yes, sir.

Cross 44. Do you think that it got on to the passenger-cars on the road about as fast as they were built after that?

A. Yes, sir.

Cross 45. Those cars you have spoken of, on which you say the brake was put after Talson applied it to the platform-car, were built by and used on the New Jersey Railroad and Transportation Company's road, were they?

A. Yes, sir.

Cross 46. Do you remember when Talson left the employ of the New Jersey Railroad and Transportation Company?

A. It must be 15 or 16 years ago.

Cross 47. May it have been longer ago than that?

A. Well, it might be a little longer; I won't be positive.

Cross 48. Were these brakes in use on those cars you have mentioned during the time M'r Talson remained on the road and when he left?

A. Yes, sir; I think they were on the road when he left.

598 Cross 49. Do you think that Talson would be likely to remember how many cars this brake were put on while he was on the New Jersey road, and how long said brake was used on the road while he was there?

A. I think he ought to; he was master mechanic of the cars.

Cross 50. Would he remember these things better than you do?

A. Yes, sir.

Direct resumed by M'r Whipple:

Q. 51. Do you wish to be understood that the difference between the brake as applied by Stanley and the one by M'r Talson was that the Stanley brake was constructed of light, frail material, and the Talson brake of firm and substantial material, fit for service?

A. Yes, sir.

Q. 52. Is the same brake now in use on the cars of the New Jersey Railroad and Transportation Company?

A. It is.

Cross 18. By what means was the power applied from this lever in the centre of the car to the brakes?

A. It was by a connection of a chain and hook to a lever in each truck; the connection went from the centre lever.

Cross 19. Did that connection go from the extreme end of that centre lever, or from a little inside of the end?

A. A little inside of the end.

Cross 20. Was there a hook at each end of the chain to hook it to the lever in the truck, and to the centre lever?

A. Yes, sir.

Cross 21. How was the brake arranged in the truck so as to apply power from one side of the truck to the other side of the same truck?

A. It was done by an eyebolt passing through the centre of the brake-beam, with which was connected a rod running across the truck to the upright lever in the truck.

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A. I am, as near as I can recollect.

Cross 24. Do you feel sure that you recollect it correctly?

A. Yes, sir, as near as I can recollect.

Cross 25. Do you think that you are at all mistaken about it?

A. I don't think I am.

Cross 26. Are you sure that the brakes were applied to the outside of the wheels, and not to the inside?

A. I am.

596 Cross 27. How long after this Stanley experiment was tried was it that, as you say, "M'r Talson went to work and put on a brake similar"?

A. I can't say; it was some time after.

Cross 28. Was it in the same year?

A. I could not say; I don't hardly think it was in the same year.

Cross 29. Was it within a year afterward?

A. I couldn't say whether it was or not.

Cross 30. Was it within two years afterwards?

A. I was just going to make a suggestion that we were very anxious to get clear of the brakes we had; it was in that light that the experiment was tried to get rid of the damage those brakes were doing. I could not say whether it was within two years; it might be, and it might be more.

Cross 31. Can you mention any time after within which it was?

A. No, sir; I cannot.

Cross 32. Was it before 1848?

A. Well, I think we had that brake in operation before that.

Cross 33. Can you give us some idea how long before that you think you had it in operation?

A. I could not; I could not come to no definite time.

Cross 34. How long, to the best of your recollection, was that brake kept in use after Talson put it on, as you say?

A. A good while—a long while; it was kept on for several years.

Cross 35. How was it constructed?

A. I have stated before.

Cross 36. Do you mean that as Talson put it on it was constructed and arranged as it was, when, as you say, Stanley tried it?

A. Yes, sir; it was a similar thing exactly.

Cross 37. After Stanley put it on, was it applied to more than one car?

A. I think it was.

Cross 38. How positive are you of this?

597 A. I am positive that it was put on more than one car.

Cross 39. How many more than one car?

A. I couldn't say how many more; cars were very few in those days.

Cross 40. Was it applied to a good portion of the cars?

A. Well, yes, sir; it was applied mostly to the passenger-cars of the Philadelphia train.

Cross 41. About how long after Talson, as you say, put the brake on was it applied to these other cars?

A. It might have been some time after it was put on the platform-car; we were building cars then, and I think it was put on the cars as they came out of the shop.

Cross 42. Would it have been within a few months after it was put on the platform-car?

A. It might have been.

Cross 43. Were you building new cars at the time Talson put the brake on the platform-car?

A. Yes, sir.

Cross 44. Do you think that it got on to the passenger-cars on the road about as fast as they were built after that?

A. Yes, sir.

Cross 45. Those cars you have spoken of, on which you say the brake was put after Talson applied it to the platform-car, were built by and used on the New Jersey Railroad and Transportation Company's road, were they?

A. Yes, sir.

Cross 46. Do you remember when Talson left the employ of the New Jersey Railroad and Transportation Company?

A. It must be 15 or 16 years ago.

Cross 47. May it have been longer ago than that?

A. Well, it might be a little longer; I won't be positive.

Cross 48. Were these brakes in use on those cars you have mentioned during the time M'r Talson remained on the road and when he left?

A. Yes, sir; I think they were on the road when he left.

598 Cross 49. Do you think that Talson would be likely to remember how many cars this brake were put on while he was on the New Jersey road, and how long said brake was used on the road while he was there?

A. I think he ought to; he was master mechanic of the cars.

Cross 50. Would he remember these things better than you do?

A. Yes, sir.

Direct resumed by M'r Whipple:

Q. 51. Do you wish to be understood that the difference between the brake as applied by Stanley and the one by M'r Talson was that the Stanley brake was constructed of light, frail material, and the Talson brake of firm and substantial material, fit for service?

A. Yes, sir.

Q. 52. Is the same brake now in use on the cars of the New Jersey Railroad and Transportation Company?

A. It is.

Cross 18. By what means was the power applied from this lever in the centre of the car to the brakes?

A. It was by a connection of a chain and hook to a lever in each truck; the connection went from the centre lever.

Cross 19. Did that connection go from the extreme end of that centre lever, or from a little inside of the end?

A. A little inside of the end.

Cross 20. Was there a hook at each end of the chain to hook it to the lever in the truck, and to the centre lever?

A. Yes, sir.

Cross 21. How was the brake arranged in the truck so as to apply power from one side of the truck to the other side of the same truck?

A. It was done by an eyebolt passing through the centre of the brake-beam, with which was connected a rod running across the truck to the upright lever in the truck.

Cross 22. Are you positive that this is the way in which the brake was arranged?

A. Yes, sir; as near as I can come at it.

Cross 23. Are you positive that you have described its arrangement in the truck just as it was?

A. I am, as near as I can recollect.

Cross 24. Do you feel sure that you recollect it correctly?

A. Yes, sir, as near as I can recollect.

Cross 25. Do you think that you are at all mistaken about it?

A. I don't think I am.

Cross 26. Are you sure that the brakes were applied to the outside of the wheels, and not to the inside?

A. I am.

596 Cross 27. How long after this Stanley experiment was tried was it that, as you say, "M'r Talson went to work and put on a brake similar"?

A. I can't say; it was some time after.

Cross 28. Was it in the same year?

A. I could not say; I don't hardly think it was in the same year.

Cross 29. Was it within a year afterward?

A. I couldn't say whether it was or not.

Cross 30. Was it within two years afterwards?

A. I was just going to make a suggestion that we were very anxious to get clear of the brakes we had; it was in that light that the experiment was tried to get rid of the damage those brakes were doing. I could not say whether it was within two years; it might be, and it might be more.

Cross 31. Can you mention any time after within which it was?

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A. A good while—a long while; it was kept on for several years.

Cross 35. How was it constructed?

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A. I couldn't say how many more; cars were very few in those days.

Cross 40. Was it applied to a good portion of the cars?

A. Well, yes, sir; it was applied mostly to the passenger-cars of the Philadelphia train.

Cross 41. About how long after Talson, as you say, put the brake on was it applied to these other cars?

A. It might have been some time after it was put on the platform-car; we were building cars then, and I think it was put on the cars as they came out of the shop.

Cross 42. Would it have been within a few months after it was put on the platform-car?

A. It might have been.

Cross 43. Were you building new cars at the time Talson put the brake on the platform-car?

A. Yes, sir.

Cross 44. Do you think that it got on to the passenger-cars on the road about as fast as they were built after that?

A. Yes, sir.

Cross 45. Those cars you have spoken of, on which you say the brake was put after Talson applied it to the platform-car, were built by and used on the New Jersey Railroad and Transportation Company's road, were they?

A. Yes, sir.

Cross 46. Do you remember when Talson left the employ of the New Jersey Railroad and Transportation Company?

A. It must be 15 or 16 years ago.

Cross 47. May it have been longer ago than that?

A. Well, it might be a little longer; I won't be positive.

Cross 48. Were these brakes in use on those cars you have mentioned during the time M'r Talson remained on the road and when he left?

A. Yes, sir; I think they were on the road when he left.

598 Cross 49. Do you think that Talson would be likely to remember how many cars this brake were put on while he was on the New Jersey road, and how long said brake was used on the road while he was there?

A. I think he ought to; he was master mechanic of the cars.

Cross 50. Would he remember these things better than you do?

A. Yes, sir.

Direct resumed by M'r Whipple:

Q. 51. Do you wish to be understood that the difference between the brake as applied by Stanley and the one by M'r Talson was that the Stanley brake was constructed of light, frail material, and the Talson brake of firm and substantial material, fit for service?

A. Yes, sir.

Q. 52. Is the same brake now in use on the cars of the New Jersey Railroad and Transportation Company?

A. It is.

Cross 18. By what means was the power applied from this lever in the centre of the car to the brakes?

A. It was by a connection of a chain and hook to a lever in each truck; the connection went from the centre lever.

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Cross 43. Were you building new cars at the time Talson put the brake on the platform-car?

A. Yes, sir.

Cross 44. Do you think that it got on to the passenger-cars on the road about as fast as they were built after that?

A. Yes, sir.

Cross 45. Those cars you have spoken of, on which you say the brake was put after Talson applied it to the platform-car, were built by and used on the New Jersey Railroad and Transportation Company's road, were they?

A. Yes, sir.

Cross 46. Do you remember when Talson left the employ of the New Jersey Railroad and Transportation Company?

A. It must be 15 or 16 years ago.

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Cross 48. Were these brakes in use on those cars you have mentioned during the time M'r Talson remained on the road and when he left?

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A. I think he ought to; he was master mechanic of the cars.

Cross 50. Would he remember these things better than you do?

A. Yes, sir.

Direct resumed by M'r Whipple:

Q. 51. Do you wish to be understood that the difference between the brake as applied by Stanley and the one by M'r Talson was that the Stanley brake was constructed of light, frail material, and the Talson brake of firm and substantial material, fit for service?

A. Yes, sir.

Q. 52. Is the same brake now in use on the cars of the New Jersey Railroad and Transportation Company?

A. It is.

Cross resumed by M'r Cozzens:

Cross 53. Has said same brake been in use on the cars of the New Jersey Railroad and Transportation Company ever since Talson put it on, as you have stated?

A. The same principle.

Cross 53. I mean the same kind of brake; please answer this.

A. I say the same kind of brake.

BERNARD HUGHES.

Subscribed and sworn to before me this 20th September, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to 11 a. m. the 21st inst.

599 SATURDAY, *September 21st*, 1867.

Present, counsel as before.

Adjourned to 11 a. m., the 23d inst.

MONDAY, *September 23d*, 1867.

Present, counsel as before.

GEORGE W. FIELDER, called and sworn on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. George W. Fielder; forty-five years of age; reside at Hightstown, New Jersey; and am a produce commission-dealer in West Washington Market, New York.

Q. 2. Have you been in the employ of the New Jersey Railroad and Transportation Company; & if so, when did you commence, how do you determine the time, and when did you leave the employ of said company?

A. I have; I commenced in the spring of 1845; I have a distinct recollection of the time when I commenced, and my eldest son was born in January, 1845, preceding the time; I left their employ in the spring of 1848.

Q. 3. When you commenced work for said company what did you hear about the application of a double brake on a car of that road, and what did you thereafter know in relation to the use of a double brake?

(First part of the question objected to.)

A. I remember hearing it talked amongst the men that there had been such a brake, but it was considered complicated and rather weak for the purpose of brakeing up a train; my recollection is, that it 600 was the Stanley brake; I think the man's name was Isaac Newton Stanley; I never saw the man; my recollection is that from that brake, as I always understood it, M'r Talson used or got up this brake that was used on the car spoken of, and when I speak of M'r Talson, I speak of him as the foreman of the shop; I believed and supposed at the time that M'r Talson had simplified and got up that brake which was used on the car spoken of; I don't know this positively; in the Stanley brake there were two cross-levers underneath the car with wire connections; the simplification of the brake by M'r Talson, as I understand, is, that there was one cross-lever across the centre under the car, and that would brake the car at either end, all the wheels.

(So much of this answer as is hearsay, and the understanding and belief of the witness, objected to.)

Q. 4. On what kind of a car was this single centre-lever brake used, and by whom was it used as brakeman?

A. It was on a platform-car, the one that generally precedes the passenger-cars in the train; my recollection is that it was used as a brake-car by a man by the name of Jobes, a portly man; I haven't seen him since that time.

Q. 5. According to your best recollection, was this double brake in use on said platform-car during the time you were in the employ of said company?

(Objected to.)

A. I couldn't say it was all the time, but think it was most of the time.

Cross-examined by M'r Cozzens:

Cross 6. What kind of a train was it in which this platform-car ran?

601 A. It was the car which carried the baggage on the Philadelphia or New Brunswick train; I can't be positive which.

Cross 7. In what manner did the wire connections you speak of connect the two cross-levers in the Stanley brake?

A. I don't know that I could give you an understanding of it; it is a good many years ago; the original Stanley brake was not used while I was there, but the machinery of it was put up stairs in the car-shop, as I remember.

Cross 8. Are you able to describe how the Stanley brake was arranged in the trucks?

A. Well, I can give it to you partly, not probably full; the point which touched the brake was *too* pieces of wood carved out to the shape of the wheel; they were placed inside of the wheels, and then there was what we called a rock-shaft; a shaft of iron, that was of a length from one wheel to the other between the wheels, across the truck transversely; upon that rock-shaft there was an arm, and at each end of the rock-shaft between those wooden blocks was a little cam, which, when you broke the car at the end of the car, would, by the turning of the rock-shaft by means of the arm, be brought against the blocks, thereby forcing them tight against the wheels.

Cross 9. When, as you say, you supposed the brake was simplified by M'r Talson, was this arrangement in the trucks just described continued?

A. No, sir; I think not.

Cross 10. What was substituted for it?

A. The pieces of wood I speak of, and known as the brake blocks, was placed on the outside of the wheels instead of between; I hardly dare undertake to explain what was substituted for the rock-shaft, but I know the blocks were put on the outside, because it was the first work I did when I went there; I know there was a connection with the centre-lever with the brakes in the trucks.

Cross 11. How often did you, yourself, see that brake used on that platform-car?

A. As often as I saw that train come in or go out from the Jersey City depot; how often that was I could not give any idea; I was at work there all the time.

602 Cross 12. When was the first time that you saw it?

A. I could not tell, sir.

Cross 15. Are you able to recollect how much of the time while you were employed on the road that brake was used?

A. Definitely, I am not, but I can tell you about the general usage of cars on the road.

Cross 14. I only want to know about that particular car with that brake; are you able to recollect as to that car how much of the time while you were employed on the road it was used with said brake?

A. I know, as a railroad man; I know it would be used whenever that train ran (it being the brake-car of the train) except when it was out of order; that I speak as a railroad man.

Cross 15. Please bear in mind that I do not ask for your opinion, as a railroad man, as to how often such a car would usually run on such a train; I ask you whether you can recollect, as a matter of fact, how much of the time, while you were employed on the road, that car with that brake actually did run?

A. Definitely, I cannot tell.

Cross 16. Is the name of the M'r Talson you have spoken of Joseph F. Talson?

A. I do not remember his first name, but it was the M'r Talson who was foreman of the car-shop of the New Jersey Railroad at that time.

Cross 17. Do you think he would be likely to recollect better than you do how long that brake was used?

A. Yes, sir; I think so.

Cross 18. What kind of brakes were used on the other cars of the train in which this platform-car ran?

A. There were two kinds; neither one of them broke upon more than one end of the car; this is also true of all the cars belonging to the New Jersey Railroad at that time; I don't remember of any others; there may be exceptions, but I don't know of any.

Cross 19. How long did they use on those other cars these brakes which broke upon only one end of the car?

A. I think they were used all the time I was there?

603 Cross 20. You say the first work you did when you went to the New Jersey road was on the blocks to be put on the outside of the wheels; was this brake as got up by Talson, as you say, a new thing when you first went to the road?

A. The first work I did was to get out those blocks, not for that particular car, but to have on hand in case one should break, to put them on; I found this brake there when I commenced work there.

GEO. W. FIELDER.

Subscribed and sworn to before me this 23d September, 1867.

R. E. STILWELL,
Examiner, &c.

Smith Ryder, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Smith Ryder; 47 years of age; reside in Brooklyn, and am a broker.

Q. 2. Have you been in the employ of the Long Island Railroad Company; if so, when were you so employed, from what time to what time, and what did you do?

A. I was in their employ; I commenced in 1843, and left in 1852; in the first place, I run the freight train to carry materials to build the road through; I then run the short passenger train from Hicksville to Brooklyn, and then the Boston train from Brooklyn to Greenport; I ran the mail trains afterwards, and the freight trains, and had charge of the depot at Brooklyn during the latter part of the time I was with them.

604 Q. 3. While employed as conductor, did you know of the use of a double-acting brake on the cars of the Long Island Road; if so, please state what you know, and tell what kind of a brace it was; that is, what was the operation?

(Objected to.)

A. Yes, sir; we had a brake there double-acting; that is, I call it a double-acting brake; it was a brake where a man could stand at one end of the car and brake both trucks at once; I know it worked with a lever in the middle, because it worked on both ends at once, and from either end; we had to be very careful, I know, to notice the brake to keep the wheels from sliding; in wet weather, in chocking the wheels, we would occasionally slide them.

Q. 4. You say you had to notice the operation of the brake and keep the wheels from sliding; to what extent have you seen wheels slide on cars which had this double-brake attached?

A. Both trucks would slide, and I have seen the wheels of one truck slide; that was owing to the blocks between the wheels being worn on one truck more than on the other.

Q. 5. And was this sliding of the wheels in both trucks produced by one brakeman or not?

(Objected to.)

A. Yes, sir; it was produced by one brakeman braking at one end of the car.

Q. 6. Could he have done the same thing from the other end of the car?

A. Yes, sir; they were both alike.

Q. 7. During what year was this brake, the operation of which you have described, in use on the cars of the Long Island Road, and to what extent was it used?

605 A. I wont say positive whether it was in 1845 or '846; it was before 1847; for I know we hauled the train off—the through Boston train, I mean—in 1847.

Q. 8. While employed as conductor in the years 1845 and 1846, did you know Uriah Van Voorhis; if so, what did he do on that road?

A. I know a man by that name; he had charge of overhauling the brakes and cars on that road; we called him the carpenter; he done this at Brooklyn; the main shop for repairs was at Jamaica.

Cross-examined by M'r Cozzens:

Cross 9. Who was president of the Long Island Road in 1845, 1846, and 1847?

A. George B. Fisk was president in 1845, and, I think, in 1846; after M'r Fisk, M'r James H. Wells was president.

Cross 10. Upon how many cars of the Long Island Road do you know of your own knowledge, that there was in 1846 or 1847, such a brake as you have referred to?

A. I am sure there were two, and there may have been more.

Cross 11. What kind of cars were these two?

A. Passenger-cars.

Cross 12. What time in 1847 was that through Boston train taken off?

A. That is more than I can tell you here; if I was home I could tell you; I think it was in the spring.

Cross 13. Did these two cars run in that train?

A. They were on that train often; I think they were in it most of the time; it is so long ago I cannot recollect exactly.

Cross 14. Is your reason for supposing that these brakes you have spoken of worked with a lever in the middle because they broke on both ends of the car?

A. Yes, sir.

Cross 15. Have you any other reason for supposing they had a lever in the middle?

A. I am pretty positive of seeing a lever in the middle.

606 Cross 16. Are you so positive of it that you are willing after this lapse of time to swear to it absolutely.

A. Yes, sir; I am.

Cross 17. Now, please state the numbers of those two cars, which had, as you say, this brake?

A. That would be an impossibility for me to do, sir.

Cross 18. Can you state anything about those two cars, or either of them, which would identify them, or would distinguish between them and the other cars on the road?

A. These cars that the brake was on, if I am not mistaken, were built by Davenport & Bridges, of Cambridgeport, Massachusetts; I could not state anything about those cars to identify them from others on the road.

Cross 19. How many passenger cars were there on that through Boston train usually?

A. As a general thing it would average three passenger cars; I have run as high as seven or eight.

Cross 20. What kind of brakes was on these other cars in this train, except these two?

A. They had brakes on each end of the car; they were single-brakes.

Cross 21. How long a time did they use single-brakes on those cars?

A. That I can't say; they run them as long as the train ran.

Cross 22. Are you able to say how long before the through Boston train was hauled off that these brakes were used?

A. I could not be positive as to the time.

Cross 23. Did they have any of these double-acting brakes on the freight-cars?

A. Not the freight-cars that I know of; I don't think they did; my opinion is, that they did not while I was there; they had one car that M'r John Arrison put it on, which was a baggage and mail-car; he put the windlass on the inside, and the man would stand inside of the car and brake.

Cross 24. When did M'r Arrison do this?

607 A. Well, that was during 1845 to 1847; I can't say what month or year it was in; I think it was in the spring of 1847 that I first noticed it.

Cross 25. Who was M'r Arrison, and what was his position?

A. Mr Arrison was the man at Jamaica who repaired the cars, built the cars, and was master of car repairs at Jamaica.

Cross 26. Did he have charge of putting brakes on the cars of the road, when they needed any?

A. He put the brakes on when the cars were sent to him at Jamaica for repair, but if there was anything they could do at Brooklyn they did it there, as they had a blacksmith and a carpenter there to do the work.

Cross 27. Did they send the cars to Jamaica when they needed any considerable repairs?

A. Any considerable repairs they sent to Jamaica.

Cross 28. Did these two cars you have spoken of as built by Davenport & Bridges have double-acting brakes on when they came on to the road?

A. Not to my knowledge.

Direct resumed by Mr. Whipple:

Q. 29. You say that you ran in the Boston train as many as eight cars, including the two which you say had the double brakes on; may not some of the other cars have had a double brake on, which escaped your observation?

A. There is a possibility about it; I could not say whether they had or not.

SMITH RYDER.

Subscribed and sworn to before me this 23d day of September, 1867.

R. E. STILWELL,
Examiner, &c.

Adjourned to 11 a. m., the 24th instant.

608 TUESDAY, *September 24th*, 1867.

Present, counsel as before.

JOSEPH F. TALSON, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Joseph F. Talson; sixty-two years of age; reside in Hudson City, New Jersey; and am in the rubber car-spring business.

Q. 2. Have you been in the employ of the New Jersey Railroad and Transportation Company; if so, when, how long, and in what capacity?

A. I have been in their employment from May, 1836, to August, 1849, as the superintendent of the car department of that road.

Q. 3. While so employed did you know of the application and use of a double-acting brake on a car or cars of that road? If so, please state what you know of your own knowledge, and at length, and give particulars.

A. I remember a man by the name of Isaac Newton Stanley bringing a note from M'r Robert Schuyler, vice-president of the New Jersey Railroad and Transportation Company, and a model with a double-acting brake upon it; this was twenty-five years ago this present month; that note requested me to give Stanley all the facilities that he wanted to apply this brake upon a car; I gave him the facilities he needed for so doing, and he applied his brake with two levers, under the body of the car, some distance from the centre; he made the connection with wire, about the size of telegraph wire, and the connections came short in closing together; the connecting rods were about six inches too short; he went to the waste-box and got some cotton-strings, and tied them together, then he asked me to order out a locomotive to try his brake; I told him they would laugh at me with cotton-strings to test a locomotive's power; I told him I would take 609 five or six of the men from the shop and would start the car on a momentum, and told him to go and get on the car and when I told him to brake, to do so; we started the car, and I stepped one side, and told him to brake, and he did so, and the strings gave way, and the men laughed at Stanley and he went away; we set the car one side on the outside track, and I did not see M'r Stanley again for six weeks; in the mean time we had to use the car; I took M'r Stanley's brake off, and laid it away carefully up-stairs in the car-shop; I then put a brake upon it myself with a single-acting lever, making the connecting rods five-eighths, and the car run upon the road on the Philadelphia line.

Q. 4. To what kind of a car was the brake applied?

A. It was applied to a brakeman's car, on what we call the Philadelphia line; it was a platform car for carrying baggage-crates on.

Q. 5. You speak, in answer to the third interrogatory, of a model in connection with the note which said Stanley brought from said Schuyler. Please describe the brake on said model, both as applied to the body of the model and to the trucks of the same.

A. The model had a single-lever in the middle with rods connecting at the extreme ends of the centre-lever, connecting with the levers on each truck; the connection from the centre-lever run to the windlass or crank, where the brake was applied at both ends; one end was the same as the other; there were two levers on each truck, one on each brake-bar. I asked Stanley why he did not put one centre-lever on his brake instead of two; his answer was, I am a watch and clock-maker, and I never worked outside of a watch or clock, and when I come to a car which is forty-five feet on the body I am lost, and that is the reason that I put two levers instead of one upon your car. I asked him why he had four levers, one on each brake-bar; he said the reason was he meant to connect the inside levers with a single rod, and do away with the bar; he connected his windlass or crank with the outside lever of each truck.

Q. 6. How did you understand that he thought the using of the two levers, instead of one, under the body of the car, would aid him in applying his brake to so long a car?

610 A. He said the reason why he used two levers was because of the great length, to divide the distance, his rods being so very light that they would not hold up; he had on his a chain running over a pulley to bring the levers back again to their proper place.

Q. 7. Please describe how the brakes were arranged in the trucks on the cars of that road at the time M'r Stanley applied his brake, and how were they arranged in the car on which he did apply the same?

A. In the first place, there was a long rock-shaft which run parallel with the axle-trees, and at each end was a cam; in the centre was a long arm or lever connecting with a connecting-rod to another rock-shaft at the end of the car; that connected with an upright step lever, and that applied by the connecting-rod to the cam betwixt the brake-blocks between the wheels. Stanley's brake was exactly as I have just described it, in one truck; the other truck, the brake-blocks were outside the wheels; he hitched his connecting-rod to the arm of the rock-shaft betwixt the wheels; the other end, he applied it with two levers, one on each end of the truck; when I took hold of the car, I put all the brake-blocks on the outside of the wheels, and made the connections with one lever in the centre of the car.

Q. 8. After the application of this brake by said Stanley, did you see him at any time or times? If so, please state the interview or interviews with him.

A. I did; he came to me about six weeks after, and I told him that I had the car in use, and he went away a few moments and came back again; I told him I thought of applying his brake to some other cars on the road, and he didn't seem to oppose it until he came the third time to me, when he said I must not do it; he said he had had an interview with M'r Timothy L. Smith, the superintendent of the motive power on that road, and that he said I had made an improvement on his (Stanley's) brake, and that I would get a patent on the improvement and knock him, Stanley, out of his right; we were applying at this time a bumper-brake, to be acted upon by the locomotive with a long draw-

beam running through the car, forming the bumper at both ends;
611 the man that brought the patent and the model there said that
he had agreed to give M'r Smith, to introduce it on that road,
$500; I never saw Stanley from that time until three years after; I met him one day in Greenwich-street, in New York. I asked him why he didn't carry out his brake-patent; his answer was, it was for the want of means. I asked him why he didn't let his case be known to me, that I would have furnished means, or found some person that would; he took hold of me and said, "Oh, if I had only carried that out (his patent), it was the greatest thing out," he said; that is all; I have never seen the man since.

Q. 9. Did you ever know Francis A. Stevens, of Burlington, Vermont, and did he call upon you at your house, in Hudson City? If so, please state his business and the conversation between you and him concerning brakes, and any particulars connected with that meeting that you may have a recollection of.

A. I well remember, four or five years ago, he came to my house, in Hudson City, and said that he was the inventor of the Stevens brake, and said if I would give him a certificate for his brake being superior to any other brake in use, he would give me $50 for that certificate. I told him I could not do it without I saw his brake and understood it well before I gave an opinion; he said if I would go with him to Jersey City he would explain it to me, and show it to me in actual use; I came from my own house to Jersey City with him, and examined the cars on the side track on the New Jersey Railroad; the first car we came to, there was a Hodge brake on it, the next was a single-lever brake, a Stanley brake; the next was a Stevens brake; he began to explain the superiority of his brake over the others, and we kneeled down at the side of the car; I heard him patiently through his explanation; I told him then that it was Stanley's brake, not his; he went away, and I have never seen the man since; I gave no affidavit nor any certificate.

Q. 10. You say, 25 years ago, said Stanley came to you with a note,
model, &c.; how do you fix that time, that is, the year?
612 A. I fix the date by the New Jersey Railroad and Transportation
Company's books; when I was called, I went immediately to the books; the account with Stanley began September 24th, 1842, and ended in December, the same year; the account was first with the brake; we at that time ran our wheels very close together; Stanley wanted the wheels further apart than we were in the habit of putting them; he went to M'r Schuyler and got permission to build a pair of trucks; he employed four men to do it, and the trucks were never completed, and Stanley went away, and the New Jersey Company had to pay the men, and that account stands on the books of the company to this day against Stanley, and during the time they were building these trucks the brake was applied.

Q. 11. Was the brake which you say was put by yourself on the platform-car and run by the New Jersey Railroad and Transportation Company in the Philadelphia line ever taken off, to your knowledge?

A. No, sir; it never was, to my knowledge; but I remember once having a hook repaired. Samuel S. Hutton, foreman of the blacksmith shop, steeled it in the throat of the hook. He said that would last as long as the car would last.

Q. 12. How were the connections made to the centre lever which you applied to said car; that is, what were their relations to each other?

A. The centre lever of the car, as I connected it, had a large hole at each extreme end of the lever sufficiently large to allow both hooks to hook in the some hole of the lever.

Q. 13. Please state, if you know, how the connections in said centre lever differ from the one now used on the cars of that road.

A. The New Jersey Railroad now connects theirs with a hook and chain, or link and hook.

Q. 14. Please state, if you know, how the same connections are made on the cars of the Camden and Amboy road.

A. The connections on the cars of the Camden and Amboy Railroad are made from about eight to ten inches from the end of the lever, and this part of the brake connects with the brake-bars or levers on
613 the trucks. The connections on the end of the bar or lever connects with a windlass when the brakeman brakes at the end of the car, which gives eight or ten inches leverage and fulcrum.

Q. 15. While in the employ of the New Jersey Railroad and Transportation Company, did you know of the use of a centre-lever brake on a car, or cars, on the Camden and Amboy road, running in connection with the New Jersey Railroad and Transportation Company? If so, state what you know, of your own knowledge

A. I do, sir; on a car called the Tyler-car. The first time I ever saw that car was in the fall of 1843. I made the remark to one of my men—I don't know which one it was—that the Camden and Amboy road never followed the example of anybody. They made the alterations in connecting the ends of the lever, and brought it down about eight or ten inches—I mean the connections with the trucks. That was, as I suppose, to give it more power.

Adjourned to the 25th instant, at 11 a. m.

WEDNESDAY, *September 25th*, 1867.

Present, counsel as before.

Q. 16. The witness is now shown Exhibit A, and his attention is called to the brake thereon, and is asked what it represents.

A. I think, as far as my knowledge extends, that that is a fair representation of the brake on the Tyler-car, as I saw it in the fall of 1843.

Q. 17. While in the employ of the said New Jersey Railroad and Transportation Company, did you know Edwin Lockwood; if so, what were your respective relations to each other during that time?

A. I have known Edwin Lockwood ever since 1836; he was the master car-builder on the Camden and Amboy Railroad, and is in that capacity still. Our relations to each other were, that our cars from
614 our road run to the Camden and Amboy road and theirs run to the New Jersey road, and I held the same position on the New Jersey road that he did on the Camden and Amboy road.

Q. 18. Have you had any conversations with M'r Lockwood of late in reference to the use of double brakes on the cars of his road; if so, when, and what was said on the occasion?

A. I have had none since last winter. M'r Whipple employed me last winter to get evidence in this case. I immediately proceeded to Bordentown. I had an interview with M'r Lockwood. I asked him if he remembered when the first double-acting brake was first put upon the Camden and Amboy Railroad. He said the first double-acting brake that he remembered being in general use on the road was put on the Tyler-car, to convey President Tyler to the Bunker Hill Monument celebration.

Cross-examined by M'r Cozzens :

Cross 19. Are you aware that in this suit there have been examined, on the part of the defendant, about thirty witnesses, who have testified concerning the Tyler-car, and other cars on the Camden and Amboy road ?

A. I am not. I don't know anything about how many witnesses.

Cross 20. Do you know that there have been quite a large number of witnesses examined respecting such cars ?

A. I do not. I never spoke to any but M'r Lockwood and one other man, whose name I don't know, about this Camden and Amboy question.

Cross 21. When did you speak to this other man ?

A. It was at the first interview, last winter, I had with M'r Lockwood.

Cross 22. What time in the winter was that ?

A. Well, I cannot say. I know that there was ice and snow on the ground, for I walked from Trenton to Bordentown.

Cross 23. You are sure, then, that it was in one of the months of last
winter, and not in either of the fall months of 1866 ?
6 5 A. To the best of my knowledge, it was in December, 1866.
Cross. 24. State who has brought together and prepared the testimony employed by the defendant in this case; state all you know on this subject.

(Objected to.)

A. The Camden and Amboy matter I have not had anything to do with; the New Jersey Railroad I have seen all the witnesses that have come on the stand; the Long Island Railroad, I saw four.

Cross 25. Do you know who has seen witnesses in regard to the Camden and Amboy matter ?

A. I do not; but I believe that M'r Lockwood has had the whole charge of the matter, so far as my knowledge extends.

Cross 26. Please mention the names of all the witnesses or persons whom you saw in regard to the brake on the New Jersey Railroad.

A. I saw John Jobes, Bernard Hughes, James Gamble, and George Fielder; and I saw Moses Parsells and Erastus Reid; I have seen a great many other persons, besides those named, that would come if I wanted them, but I didn't want them.

Cross 27. State the names of those other persons.

A. Hurd is one, but what his christian name is, I can't say; Ambrose Ward is one; there is another one yet, but I cannot remember his name.

Cross 28. In giving this last answer, did you remember Ambrose Ward's name until you were reminded of it by M'r Whipple ?

A. I did not.

Cross 29. Are Hurd and Ward, and the third one whose name you can't remember, all of them, or are there others, besides ?

A. There are several others.

Cross 30. Can you state the names of any of those others ?
616 A. Yes, sir; there is Edgar Morris, Nicholas Schæffer, George
Fielding, James Clarke, William Sanderson; I can't remember any more just now; I have no doubt there are more, but I can't think of them just now, but I have seen all the men.

Cross 31. State what conversation took place between you and these persons, including both those who have been witnesses and the others.

A. Edgar Morris said he knew nothing at all about it; Nicholas Schæffer said that he couldn't remember anything at all about it; George Fielding said that he couldn't remember anything at all about it; James Clark said he couldn't remember anything at all about it—he worked on the trucks, he said, for Stanley; Moses Parcells said that he remembered the brake, and was willing to come and make a statement to that effect; William Sanderson said that he worked upon the trucks for Stanley; that he remembered the man, and remembered the brake; Ambrose Ward said he remembered that on a baggage-car on the New Jersey Railroad there was a double-acting brake with one centre lever on it; M'r Hurd, who runs a locomotive on the New Jersey road, said he was willing to come into court and testify that there was put on, by me, a double-acting brake with one centre lever, and that it run on the New Jersey Railroad; Erastus Reid was foreman under me; he was here, in court, one day, but his health was so poor that he could not stay in court; he is very feeble, and went home without giving his evidence; he said he would testify that Stanley put the brake on the road, and that I strengthened it, and that it ran on the road.

Cross 32. Do you think that those are all you saw?

A. I cannot state whether it is or not.

Cross 33. Within how long is it that you have seen all those persons? State as near as you can.

A. It is since M'r Whipple employed me in this case; I have seen all the men I have stated, since M'r Whipple employed me; some of them I have seen within the last two weeks, and I have had interviews with them all along, during this year.

617 Cross 34. State more definitely, if you can, when you saw Morris and Reid.

A. I haven't seen Morris since January or February, I think, of this year; and I saw Reid here, in court, last week; I had seen Reid before about this matter; I have had three interviews with him; the first one, I should think, was over six months ago; the second one, I should think, about three or four months ago, and the last one was last week; I think those were all the times I have seen him about this matter.

Cross 35. Did you know a man by the name of Edward Beattie, and is he living?

A. I did know him—he is not living.

Cross 36. Did you know Timothy L. Smith, and is he living?

A. I did know him—he is dead.

Cross 37. When you saw these various persons mentioned in regard to this New Jersey brake, what did you say to them? State as fully as you can.

A. Well, I will tell you what I said as near as I can remember; I asked them if they remembered Isaac Newton Stanley applying a double-acting brake upon the New Jersey Railroad; some would say they did, others would say they did not; those who said they did remember, I talked to upon the subject; those who said they did not, I stopped the conversation.

Cross 38. To those who said they did remember, what did you say?

A. I asked them to describe the brake, and they did so.

Cross 39. Did you tell them how long the brake was used, or did you talk to them about how long it was used?

A. No; whatever there was, they said themselves; I did not dictate to them in any way or shape.

Cross 40. Did you remind them of any circumstances connected with it, or try to refresh their memory in any way?

A. I might have done it, but I think not.

Cross 41. Did you find those who did remember about it, fresh and clear in their recollection?

618 A. I did, sir.

Cross 42. Did they not require any time to think the matter over, to bring the facts to their mind?

A. As a general thing they did not.

Cross 43. What did you say to those who did require time?

A. I told them to consider over it and let me know; those who wanted time, to consider of it.

Cross. 44. Are you able to state anything which you said, or may have said to any of those persons, by way of refreshing or helping your memory?

A. Not as I know of; I don't remember as I said anything; their memories were as fresh as mine.

Cross 45. Are you, then, positive that you did not say anything to any of them to help or refresh their memory?

A. I might, or I might not; I cannot say that I did.

Cross 46. Did you, while this last question was being dictated to the examiner, see the counsel for the defendant shake his head, as if intimating that a negative answer should be given to the question?

A. I saw him shake his head just as I have seen Mr Cozzens shake his head to Mr Sayles a number of times.

Cross 47. Are you able to remember anything at all that you may have said to any of those persons referred to, by way of helping their memory?

A. I am not.

Cross 48. Did you not say anything to any of them about how long the brake remained on the road, or how many cars it was applied to?

A. I might have done it to get at the facts in the case.

Cross 49. What did you so say?

A. I cannot remember.

Cross 50. Can you remember the substance of what you so said?

A. No, sir; only as I stated before to get at the facts in the case.

Cross 51. Did you tell them in substance that it was used on the road a long time?

A. I did not, sir.

619 Cross 52. Did you tell them in substance that it was not used on the road a long time?

A. The same answer; I did not.

Cross 53. Referring particularly to Bernard Hughes; state whether you said anything to him when you talked with him, by way of refreshing his memory?

A. I don't think I did; Bernard Hughes was one of the witnesses on the trial at Albany.

Cross 54. Can you state positively whether you did or not?

A. To the best of my knowledge and belief, I believe I did not.

Cross 55. Do you know the substance of what Bernard Hughes has testified to in this suit?

A. I do not.

Cross 56. When you talked with him what did he tell you that he remembered about the subject?

A. He said he remembered it distinctly, and said the car and the brake was on the road to this day; he said he thought the car was on the freight train.

Cross 57. Is that all he said that he remembered?

A. No, sir; he distinctly remembered the whole of it, he said, and he described it to me.

Cross 58. Please repeat the description of it which he gave you.

A. It was the tying up of the Stanley brake with the strings, pushing the car on the track, Stanley brakeing upon the same, and me strengthening up the rods, and putting one lever instead of two.

Cross 59. Was he able to describe to you how the brake was arranged and constructed between the trucks, and in the trucks; and if so, how did he describe it?

A. He described as Stanley having two levers, and mine having but one, his being very weak and mine of sufficient strength to do the duty of the brake; he said something to me, if I mistake not, about Stanley's brake, that one truck broke inside and the other on the outside of the wheels; he could not describe it mechanically, because he was not a mechanic.

620 Cross 60. Did he give you any description at all about how it was constructed and arranged in the trucks?

A. No more than I have described.

Cross 61. Did he mention about the rock-shaft that was used in the trucks?

A. I don't believe that he did, for we used altogether that kind of rock-shaft on the road.

Cross 62. Did he know whether the Stanley brake had a rock shaft in the trucks, or not?

A. I believe I did, for I believe he helped to shove the car when we tried the Stanley brake, and we all of us thoroughly examined the car at that time.

Cross 63. Prior to the experiments with the Stanley brake, had there been any of the trucks of the cars on the New Jersey road, which had brake rigging on them at all which did not have the rock-shaft arrangement, which you have described?

A. There were two different kinds, each of which had a rock-shaft; one of these kinds had two rock-shafts, and the other, one rock-shaft; there was a third kind which had a triangle worked by a foot-lever which was pressed out by the driver, and worked by two wheels only; after Stanley came all these were dispensed with, and the clogs, as a general thing, were put on the outside of the wheels; Stanley originated the idea of putting the clogs on the outside of the wheels, as far as I know.

Cross 64 Down to the time of the Stanley experiment were there on the New Jersey road, to your knowledge, any other kind or kinds of brake gear in the trucks which were not either this triangle form you have described, or some variety of the rock-shaft form?

A. I know of others, but I am not able to give a description of them at this late day.

Cross 65. How many of those other kinds were there?

A. If I mistake not there were five kinds; three of which I have described, and the other two I cannot describe them minutely.

Cross 66. In regard to those other two kinds, cannot you give some idea of the means by which the brake blocks were forced against the wheels?

A. I cannot.

621 Cross 67. In those other two kinds were the brake gear in the trucks, like the brake gear in the trucks of Exhibit A?

A. No, sir.

Cross 68. Was it like the brake gear in the usual four-wheel trucks of double truck, or eight-wheeled cars, which use the centre-lever brake, such as are now used on the New Jersey railroad?

A. It was not.

Cross 69. Did Hughes remember anything more, or give you any more descriptions than you have above stated?

Cross 70. Has any other person beside yourself been engaged in seeing and talking with the persons, who have been seen in relation to this brake on the New Jersey road?

A. Yes, sir; M'r Sayles, M'r Waterman, Edgar Morris, and M'r Whipple.

Cross 71. Who, besides M'r Whipple and yourself, have done so on the part of the railroads?

A. Nobody, to the best of my knowledge.

Cross 72. If anybody else had, you would have known it, would you not?

A. I think I would.

Cross 73. Did M'r Whipple see and talk with them, before you did, or afterwards?

A. I cannot say that, sir.

Cross 74. After you had talked with them did you inform M'r Whipple of what they said?

A. Sometimes I did, and sometimes I did not.

Cross 75. Did you in any instances suggest to M'r Whipple to call on them, himself?

A. I did not.

Cross 76. In the cases in which you did not inform M'r Whipple of what the parties said, did you get the parties to go to him?

A. I might have done it, and I don't know as I did.

Cross 77. After you had seen Jobes, Hughes, Gamble, and Fielder, did you inform M'r Whipple of what they said?

A. I did; that is what M'r Whipple employed me for.

622 Cross 78. Before you saw these last-named persons, had M'r Whipple seen them?

A. No; because I had been acquainted with them 25 years.

Cross 79. Were you the first to give M'r Whipple or any one else connected with the defendants in this case, the information that these last-named persons would be of use to the defence?

A. I was; M'r Whipple brought an instrument to me in writing, dated, if I mistake not, in 1853; he asked me if the signature on it was mine; I told him it was, and he asked me if I could prove what that instrument stated; it was an affidavit sworn to by me, respecting the double-acting brake, drawn by Richard Middleton, and he told me it was drawn for M'r Gifford and M'r North, of the Hudson River Railroad; M'r Whipple asked me if I could prove that affidavit by good and substantial witnesses; I told him I could get him from ten to twenty witnesses from different roads; he asked me if I was in business; I told him I was not in any business at that time; M'r Whipple told me that he wanted to employ me to work up this case, and I have been so employed at different times, since that time, and I believe that was in December last.

Cross 80. Have you that affidavit, or a copy of it in your possession?

A. I have not; I believe M'r Whipple has it; I have not seen it, to the best of my knowledge, since.

Cross 81. Will you please state, as nearly as you can remember, the contents of that affidavit?

A. That affidavit stated, that in the year 1842, one Isaac Newton Stanley brought a model of a double-acting brake to the New Jersey Railroad, and that it was applied upon the same road, giving a description of the brake; that is about the substance of it.

Cross 82. Did it state that Stanley's brake failed, and that you took up the matter and strengthened the brake, and put it on to a car; and did it state how long the brake, as you arranged it, was used on the road, and upon how many cars it was used?

623 A. It did state after Stanley's brake failed that I did take it up and strengthen the brake, but the length of time it was on the road it did not state; but I have asked since then, in looking up this evidence, several parties, if they ever knew the brake to be taken off; they said they did not remember of its ever being taken off, neither do I; it did not state that Stanley put it on one car, and that I changed it on the same car; and it did not say anything more than about one car; and I say distinctly, that it never was used on more than one car of that road while I was on the road; that, in substance, is all there was in the affidavit.

Cross 83. Please state the circumstances under which that affidavit was made by you?

A. I don't know. Mr. Gifford and Mr. North were in the room, and I had, I think, either three or four models of little cars with a double-acting brake upon them. Mr. Gifford says to me, "Mr. Talson, I want you to give me a mechanical opinion on these double-acting brakes." I examined each model carefully, and I said, so far as my mechanical ingenuity carries me, there is a little mechanical difference in the arrangement, but the princip*al* is the same thing. That is my opinion as I then told him, and Mr. Gifford said that he thought my opinion was correct; and that is all that is said. It was from one to three months afterwards, I think, when I made the affidavit. The affidavit was drawn under my direction by Richard Middleton, who is now dead.

Adjourned to 11 a. m., the 26th inst.

THURSDAY, *September 26th*, 1867.

Present, counsel as before.

Cross 84. State, if you know, whether at the time that affidavit was made by you a suit had been brought by Henry Tanner against the Hudson River Railroad Company upon the patent concerned in this case?

A. Not that I know of.

624 Cross 85. State, if you know, whether Mr. Gifford and Mr. North or either of them saw that affidavit?

A. Not to my knowledge.

Cross 86. Did Mr. Whipple say to you where he obtained that affidavit? If so, what did he say?

A. He said, if I understood him right, that he obtained it from the Hudson River Railroad.

Cross 87. Did he say when?

A. He did not.

(Counsel for the defendant here states that he will have a certified copy of the original of said affidavit annexed to the deposition of this witness.)

Cross 88. Do you know any other persons besides those whose names you have mentioned who know anything about this brake on the New Jersey Railroad? If you do, please state their names.

A. Yes, I do. I know several men, and think I could add to the list by looking over my memorandum at home; but I don't know as I remember their names now.

Cross 89. Will you, when you return home this afternoon, look at those memoranda, and will you, to morrow, give the additional names you may find in them?

A. I will endeavor so to do.

Cross 90. With the exception of the names already mentioned in this deposition, and with the exception of such additional names as you may find in those memoranda, do you know of any other persons who know anything about the use of this brake on the New Jersey Railroad prior to 1847?

A. I don't know as I do, but I think I do.

Cross 91. Will you to-morrow give us the names of all those persons whom, as you say, you think you know to be acquainted with the subject enquired about?

A. I will endeavor to do so.

Cross 92. Have you communicated to defendants' counsel all you know on the subject of the brake on the New Jersey Railroad?

625 A. I believe I have communicated all to Mr. Whipple.

Cross 93. You say that immediately upon Mr. Whipple's employing you in this case in December, 1866, you went to Bordentown to see Mr. Lockwood. What made you go there, and why did you want to see Mr. Lockwood?

A. The reason was I told Mr. Whipple that the Camden and Amboy road had a double-acting brake upon it the year after we put it on the New Jersey Railroad. He told me then to go and see about it. I went and had an interview with Mr. Lockwood at Bordentown. The first question I asked him was what year it was they put the first double-acting brake upon their road. He said, "I cannot tell the year, but it was on the Tyler car"; and that is all that was said at that time. We sat there for a little while, and I then asked him if would refer to the books and give me the dates, and I then left him. The next interview I had with him was about from two to three weeks afterwards, and he said then that the Tyler car was put on the road in 1843, and that they had bought the car from the Philadelphia and Trenton Railroad Company, a new car; and that in 1843 they took John Tyler over the road in that car to New Brunswick on his way to the celebration of the Bunker Hill Monument; and that after that car had run awhile they put on double-acting brakes on two or three other cars, and that they were still on the road.

(At the request of the defendants' counsel this answer was here read over to the witness, whereupon the witness said he desired to correct the remark about its being a new car by saying that he did not mean to say that it was a new car, but that it was a new car to them on their road, and when they bought the road the car came to them.)

Cross 94. Before saying that you wished to make this correction, did Mr. Whipple pass to you under the table a piece of paper or show you a piece of paper?

A. He did not, sir. I never touched a piece of paper from Mr. Whipple nor see it.

Cross 95. Is that all the conversation that occurred at both those interviews between you and Lockwood?

A. It was not.

Cross 96. Please state it all.

626 A. Mr. Lockwood, when I asked him to be so kind as to make a model, said that he didn't know that the Camden and Amboy Railroad would care about going into the suit. I understood him to say that they had bought the brake, and paid for it to Mr. Sayles, for a small amount, and under those circumstances he thought the company

would not go into the suit. I told him that the patent had been renewed, and he said that would make a difference; and I never saw Mr. Lockwood again until I saw him on the stand. That is all I had to do with the Camden and Amboy concern.

Cross 97. When was it that M'r Lockwood said that the road had bought it or paid for it a small amount to M'r Sayles?

A. It was at the second interview, which was in January, I think, 1867.

Cross 98. When you saw M'r Lockwood at these times, did you know that a large number of the railroad companies of the United States had formed an association to, among other things, defend this patent?

A. I did not, nor neither do I know it yet.

Cross 99. When you first saw M'r Lockwood, did you find his memory clear and fresh about this double brake on the Tyler car?

A. I did, sir.

Cross 100. Did he, without any help from you, give you without any hesitation or reflection a clear and full account of it and of its being used as you say he stated?

A. He gave me a full account of it, but coming upon him so unawares that he said that he wanted a day or two to reflect upon it. But he told me distinctly of the Tyler car brake with its operations and a single lever in the middle of it. That he described very minutely, and I could not describe it better than he did.

Cross 101. What was it, then, that he wanted a day or two to reflect upon?

A. He said he wanted to see M'r Van Rensalaer, and see if they would enter into the matter.

Cross 102. Was that all he wanted to reflect upon?

A. He didn't assign anything else.

627 Cross 103. At your first interview, was his memory fresh and clear that after the brake was used on the Tyler car in 1843 it was soon after put on other cars on the Camden and Amboy road?

A. It was.

Cross 104. Did he, at either of the interviews had with him, mention the names of any persons who could testify in regard to this brake on the Tyler car?

A. He did.

Cross 105. Whose names did he mention?

A. I could not say who the men were, for they were entire strangers to me, but he named over one man that I knew; that was John Barney; and he said that if John Barney was alive at this time he would have been a very good witness in this case.

Cross 106. Did he name to you Nichol F. Smith and William Venable as persons who knew about the use of this double brake on the Tyler car?

A. He named over to me six or seven names, but whether he named those persons I could not say; he might or he might not.

Cross 107. Did he say whether he remembered anything about the trial of the Stanley brake, and of said brake, as you changed it, in 1842?

A. I don't know that we ever named the Stanley brake. I went to see him, and I said we put our brake on in 1842, and you did the year after. I believe that was all that was said about it.

Cross 108. What made you think that they put on the brake the year after the Stanley brake?

A. I didn't think at all. I was sure, because I saw it with my own eyes.

Cross 109. When and on what car?

A. In 1843, on the Tyler car.

Cross 110. Did you see it often on that car in 1843 and afterwards?

A. No, sir; I did not often see it. That was a special car, fitted up different from other cars. The seats inside were what you may term rocking-chairs, tete-a-tetes, and armed chairs, and, I believe, what they call conversation chairs. There were five or six different kinds,
628 and that car was only used over the New Jersey Railroad on special occasions.

Cross 111. Did you see the double brake on that Tyler car in 1843 and afterwards often enough to have a clear recollection that it had a double brake, and how such brake was constructed and operated?

A. I believe I did.

Cross 112. When, as you say, you told Lockwood that "we put our brake on in 1842, and you did the year after," did you mention the name of the car on which the Camden and Amboy road put it on the said year after?

A. I did not, sir. M'r Lockwood did himself.

Cross 113. Didn't you remember what car they put it on the year after?

A. Yes, I did, sir; but I didn't remember the name until M'r Lockwood called it the Tyler car, and then I distinctly remembered the name.

Cross 114. Did you remember enough about it to recollect that the car on which the Camden and Amboy Railroad put the double brake the year after was a special car fitted up in the peculiar manner you have mentioned?

A. Yes, sir.

Cross 115. Did you remember all that when you first went to see Lockwood, and before you had seen him on the subject?

A. I did. I have never conversed with M'r Lockwood or any of the Camden and Amboy people about the fitting up of the car. M'r Lockwood told me that he had told M'r Sayles that the double-acting brake was on the Tyler car. He said M'r Sayles and a M'r Waterman had both been there.

Cross 116. How long did your first interview with M'r Lockwood last, and how long did your second one last?

A. I think it was about an hour each time.

Cross 117. At which of the interviews was it that M'r Lockwood said this about M'r Sayles and M'r Waterman?

A. I think it was the last one, in January, 1867.

Cross 118. Did you, when you first went to see Lockwood, remember enough about this brake on the car on the Camden and Amboy road to be able to speak of it to him?

A. I did, sir.

629 Cross 119. How soon after your first interview with him commenced were you able to allude to it to him?

A. Immediately.

Cross 120. Did he first speak to you or you first speak to him about it?

A. I first spoke to him and said, "You had a car on your road with a double-acting brake on it the year after we had on the New Jersey road." He said, "Yes, the Tyler car."

Cross 121. Did you, in the course of your conversation with Lockwood at your first interview, speak of the peculiarities of this Tyler car, or allude to them in any way?

A. I did not, nor to any other witness, to the best of my knowledge, nor till I described it in this court.

Cross 122. How long, then, have you kept in your memory the peculiarities of this Tyler car which you have to-day mentioned?

A. Ever since 1843. I have never seen a car fitted up inside as that car was before nor since, to the best of my knowledge, and that is the peculiarities of that car.

Cross 123. Do you, then, mean to be understood that ever since 1843 down to the present time you have remembered that Tyler car and its peculiarities?

A. I do, sir.

Cross 124. Could you at any time since 1843 have called it to recollection and described it?

A. I could have done it at any time had I been called upon.

Cross 125. Could you at any time since 1843 down to the present time have remembered that it had upon it in 1843 a double-acting brake?

A. I could, sir.

Cross 126. Such a double-acting brake as is shown in Exhibit A?

A. Yes; and I believe it is a fair representation of the brake on the Tyler car.

Cross 127. Do you mean to be understood that at any time since 1843,
when you might have been called upon, down to the present time,
630 your recollection of this brake, which you say the Tyler car
had on in 1843 and afterwards, was clear enough to have enabled you to describe its construction and arrangement, as it is shown in said Exhibit A?

A. I think I would, with a few days' reflection.

Cross 128. May you not be mistaken about your remembering it so clearly as that during all this time?

A. I think not, with a few days' reflection.

Cross 129. Mr. Talson, do you mean to be understood that at any time since 1843 down to the present time, when you might have been called upon, your recollection of this brake, which you say was on the Tyler car in 1843 and afterwards, was clear enough to have enabled you to state that it was a brake which operated on both trucks of the car, from either end of the car?

A. I do, sir. I will give you my reasons. I have had it under advisement for a good many years. I was employed by the New York and Erie Railroad when they had a suit in Albany against this Batchelder & Thompson's brake. I wanted them to take up this brake at that time, and that makes me so pretty well posted on that brake and car.

Cross 130. Could you at any time since 1843 have told that this brake, which you say was on the Tyler car in 1843, did, as you have stated, act on both trucks of the car, from either end of the car, without a few days' reflection?

A. Yes, sir; in a moment. I could have told it any time.

Cross 131. Could you so have told that it did this by means of a lever under the body of the car?

A. I could, sir; because I have never seen it since it run upon the road in 1844 or 1845, to the best of my knowledge; and the reason why is that its connections were made from eight to ten inches from the end of the centre lever; was different from Stanley's brake. That is the reason why I was so impressed with this Tyler brake.

Cross 132. When did you first notice this peculiarity about the connections of this Tyler brake?

A. The first time I saw it in 1843.

Cross 133. You then reason, do you, that at any time since 1843 down to the present time you could have told, without needing to reflect, that this brake, which you say was on the Tyler car in 1843 and after- 631 wards, acted on both trucks of the car, from either end of the car, by means of a centre lever under the car having this arrangement of connections you have mentioned?

A. Yes, sir; I could have done that at any moment without reflection.

Cross 134. Have you consulted at all with M'r Whipple in relation to anything connected with the putting in evidence by the defendants in this suit of this Tyler brake?

A. I have; M'r Whipple employed me for that.

Cross 135. Has all of which you have testified to in this case, in regard to the brake on the Tyler car, and also in regard to the brake on the New Jersey road in 1842, been fresh in your recollection from the time these brakes were put on, as you say, down to the present time?

A. Not all the time in my mind; it has been fresh in my recollection. If I see a railroad improvement I very seldom forget it. The next day after M'r Whipple employed me I went immediately to the Camden and Amboy road, because I knew the brake was there.

Cross 136. Do you then mean that what you have testified to in this case, both about the Tyler brake, and the brake on the New Jersey road, has been fresh in your recollection ever since 1843?

A. I think it has, and I will tell you my reasons. I have been waited upon by different patent agents of brakes, M'r Sayles, M'r Hodge, M'r Stevens, and others, that even if I would have let it rest in my mind, they came to me so frequently to consult with me that they kept it fresh in my mind all the time.

Cross 137. Then, at any time since 1843, you could have testified about this Tyler brake, and this New Jersey Railroad brake, if you had been called upon to do so, as you have testified in this case, could you?

A. I could, if I had had the same time allowed me to have worked up the case as it is now.

Cross 138. Do you then mean that it would have taken you considerable time to recollect what you have in this case 'tified to about these two brakes?

632 A. I give the same answer as I did before, that if I had had about two or three days myself I could have done it; but I am speaking of others.

Cross 139. What do you mean by the expression, "I am speaking of others"?

A. I mean other witnesses that have been examined in this case.

Cross 140. And how do you mean to apply this remark to your answer number 138?

A. I mean that the witnesses lived so far apart that it would have taken me weeks to have seen them, nearly a month; but I had no difficulty with the witnesses, but I had difficulty in finding them at home; sometimes I would not find them home in two or three days; the major part of the witnesses were entire strangers to me.

Cross 141. At any time, between 1843 and the present time, how much could you have told if you had been asked about the brake on the Tyler car without needing time to reflect?

A. I could not have told the name of the car, but I could have told you that the Camden and Amboy road had such a car with a double-acting brake, acting in both trucks from either end of the car, with a centre lever and four connecting-rods.

Cross 142. Could you also have told when they had such a brake, or about when?

A. I have answered that question before; near a year after we applied it on the New Jersey Railroad.

Cross 143. Do you mean by this answer that you could have told that it was about a year after you had applied it on the New Jersey road?

A. I do, sir.

Cross 144. Could you also have told that you had seen this brake on the Tyler car again after you first saw it as you say, and, if you could, what could you have told?

A. I could; just what I have told now in this deposition.

Cross 145. At any time between 1843 and the present time, how much could you have told, if you had been asked about this brake which you have testified to on the New Jersey road, without needing time to reflect?

633 A. I could have answered the question if you had asked me immediately, all that I have said here in this deposition; I needed no time to reflect, because I superintended the work myself.

Cross 146. You are sure, are you, that, without needing any time to reflect, you could at any time, between 1843 and now, have testified about this brake on the New Jersey road, if you had been asked, just as you have testified about it in this deposition?

A. I believe I could, sir.

Cross 147. May you not be mistaken about that?

A. No, sir.

Cross 148. Please state, if you know, the names of any other persons than those who have testified in this case about the Long Island Railroad who could testify about the brake which has been put in evidence from that road by the defendant.

A. I will give you the names to morrow from my memorandum-book.

Cross 149. Who has had the principal charge of looking up and getting together the testimony which has been put into this case by the defendants, about the brake on the Long Island road?

A. I began, looked up two or three witnesses; I then put it into the hands of M'r Josiah Phillips, and he brought the witnesses here.

Cross 150. What did you have M'r Phillips do in the matter besides bringing the witnesses here?

A. Nothing at all. I went to M'r Phillips and I asked him if he knew anything about a double-acting brake being put upon the cars of the Long Island Railroad, and he said he well remembered it; he had his leg broke the year that this brake was put on; I asked him what year that was; he said it was 1845; I asked him if he was not mistaken; he said no; says he, "I will bring you twenty or thirty witnesses to prove it." I told him I wanted him to get them for me until I told him to stop; he did bring the witnesses here; some testified, and some had to go back; their business called them, they could not wait.

634 Cross 151. How came you to know anything about there being a double brake used so long ago on the Long Island Railroad?

A. I went to Arison, the superintendent of the Long Island Railroad car department, now superintendent of the Brooklyn City Railroads; he told me that he was the inventor of the double-acting brake. I asked him when he put it upon the cars of the Long Island Railroad; I asked him what year it was in; he said he thought it was in 1845 or 1846, and it might have been earlier; he could not fix the date, he said, by anything; he sent me to Hunter's Point to his brother-in-law; I think his brother-in-law's name was Bennett, but am not sure. Bennett told me that he could not remember the date, but he referred me to M'r Robert White, the superintendent of the Long Island road, who gave me the names of several men, and among the rest was this M'r Phillips.

Cross 152. What first led you to go to the Long Island road at all?

A. Well, I will tell you. In 1844 the New Jersey Railroad Company's ferry-boat brought four eight-wheeled passenger cars from Eaton & Gilbert, at Troy, to the Long Island Railroad; M'r Schuyler sent a note to me to go and take these cars off the boat and put them on the Long Island road at South Ferry, Brooklyn; I did so, and I saw what I thought appeared to be the remains of a double-acting brake at that time; that is what made me go to M'r Arison. M'r Arison said that he was at Jamaica at this time, and one of his men did go to Van Vorhis, one of the witnesses who testified in this case.

Cross 153. What remains of a double-acting brake did you remember seeing at that time, and where did you see them?

A. It appeared to me to be two rods and part of a lever, and they laid on the side of the dock near the car-house.

Cross 154. How long have you remembered that you saw those remains?

A. Ever since that time in 1844, when they opened the road through to Greenpoint; I was a good deal acquainted with that road. I lent them cushions from the Harlem road when they opened the road
635 to Jamaica, which was in April, 1836, and I agreed with M'r
George Schuyler to go the first day of May, 1836, on the New Jersey road to take charge of the car department.

Cross 155. How long did you continue to be a good deal acquainted with that road?

A. I can't tell; from that time to this.

Adjourned to the 27th instant, at 11 a. m.

FRIDAY, *September 27th*, 1867.

Present, counsel as before.

Cross 156. With the exception of the witnesses or persons speaking in relation to this brake on the Long Island road, who were seen by M'r Phillips at your suggestion, as you have stated, have you seen all the others of whom enquiries have been made respecting said Long Island brake?

A. No, sir.

Cross 157. Who else, beside you and Phillips, has seen any of them?

A. No one has seen them, to my knowledge, except those who have come here to court, and M'r Whipple has seen them after they came here; but M'r Phillips said that he had a number of names of persons that would come and testify in the case if required.

Cross 158. Do you mean that those witnesses who have testified about the Long Island brake, in this case, saw and talked with other persons on the same subject?

A. I cannot say that; the parties who did not testify told me of several other parties that they named, who would willingly come forward and testify in the case, and they told me that they were good witnesses.

Cross 159. Were these persons who told you of those other parties the persons who came here to testify, but, as you before stated, went away without testifying.

A. Some of them were, and some of them were not.

636 Cross 160. Had M'r Whipple seen any of the witnesses, who have testified about the Long Island brake in this case, before they were brought to him, shortly before they were examined?

A. Yes, sir; he saw M'r Phillips. I went with M'r Whipple to East New York, and that is all he saw. M'r Whipple asked him if he knew anything about a double acting brake on the Long Island Railroad; he said, he well and distinctly remembered it. M'r Whipple asked him if he could prove it by others to back him up in the case; he said he could get from twelve to twenty witnesses. M'r Whipple told him to do so, and bring them to 41 Chambers street; he did so, until M'r Whipple told him to stop.

Cross 161. Who first brought to M'r Whipple's notice this matter of the use of a double brake on the Long Island road in 1845?

A. I did myself.

Cross 162. Have you, in the course of your looking up witnesses in this case, traveled considerably or at all about the country? If so, please state in a general way how much you have travelled, and to what places you have been?

A. I am employed by M'r Whipple to look up evidence in this case, and I am traveling-agent for the Mead Rubber Car-Spring Company; in my traveling around the country I have been through the New England States, State of New York, New Jersey, Pennsylvania, Maryland, Delaware, and Virginia. I have done the business of the company in connection with M'r Whipple's business at the different points where I have traveled. I had two businesses; I went on the rubber business more particularly, and the business of looking up evidence for this case was incidental to it; the business of the rubber company took me to all the railroads.

Cross 163. Did you, in the course of this traveling about, wherever you thought there might exist facts or testimony which would be of use to defendants in this case, enquire about it and look for it?

A. Certainly I did; for I was employed for that.

Cross 164. Did you bring with you this morning the names which you were yesterday requested to procure?

637 A. I did, and they are as follows: From the New Jersey Railroad, Samuel Moore, Edward Cudlipp, Edward Moore, George Vanderhoof, William Parker, Joseph Aur, Mark Harrington, Howell Roe, John Overton, William Sanderson, George Fielding, James Clarke, Ambrose Wade, Isaac Van Horten, Nicholas Schaeffer, John Manahan. From the Long Island Railroad, David Reynolds, Isaac Creigley, Robert White, Lewis Morton, M'r Runtil, Captain Rogers, M'r White, M'r Arison, W'm McLaughlin, M'r McGee, William Humphreys, Andrew McBride, John Smith, Patrick Mitchell.

Cross 165. Are these names and the others heretofore mentioned by you in this deposition all the persons who know about the Long Island brake and the New Jersey Railroad brake, whose names you at this time are able to recollect and stat'?

A. I don't know but what I might remember two or three more. I won't state any more, however.

Cross 166. Was the pivot or bolt by which the two levers under the car body were attached to the car in the Stanley experimental brake like the pivot attaching the centre-lever in Exhibit A, or were those levers, or either of them, fulcrumed on a pivot or pivots which were not fixed?

A. They were not the same as Exhibit A; the pivot was fast in the centre through the bottom of the car, but no strap over it as in Exhibit A.

Cross 167. You mean then, do you, that the Stanley cross-levers were attached to the car body the same as the centre-lever in Exhibit A is attached, except that they had no strap over them?

A. Stanley's brake-levers were fastened to the bottom bar of the car; Exhibit A has a longitudinal timber in it which carries the lever; there is that difference.

Cross 168. What other difference or differences were there besides this one of the longitudinal timber and the matter of the strap you referred to?

A. There was no difference except the strap and longitudinal timber.

Cross 169. How was the centre-lever in the brake you put on
638 to the car on the New Jersey Railroad attached to the car?

A. It was attached to the bottom bar.

Cross 170. What do you mean by the bottom bar?

A. I mean one of the timbers which run crossways on the car which supports the floor.

Cross 171. By what means was the centre-lever attached to this bottom bar?

A. By a bolt running through the bar, through the lever, and through the floor of the car.

Cross 172. Did this bolt attach the lever to this bar in the same way as the bolt in Exhibit A attaches the centre lever to the longitudinal timber in that exhibit?

A. It was the same as in that exhibit, leaving out the strap and the longitudinal timber, and the bolt went through the bottom of the car; it was a nut-headed bolt, boxed into the bottom of the car, with a jamb-nut underneath the lever or bar.

Cross 173. Was there any more play or movement allowed to the levers upon these bolts in the Stanley experimental brake and the brake you put on than is represented by the model Exhibit A?

A. No, not a bit; and Stanley's and mine were both alike in that respect.

Cross 174. In the brake which you put on to the car on the New Jersey Railroad, how did you arrange brake levers in the trucks?

A. Connected them to the centre-lever and likewise to the windlass at the end of the car; it was arranged in the trucks as follows: The upper end of the front lever, that is, the lever nearest the windlass, I attached to the truck, the lower end I connected with the brake-bar, and from the lever on this brake-bar I connected across the truck under the axles by a rod to another lever on the back brake-bar, and this last lever was connected to the centre-lever; in the Stanley brake it was arranged in this manner in one of the trucks, while in the other truck it was arranged with a rock-shaft arm and cams, as I have before described; when I put
the brake on I removed the rock-shaft from this truck, put the
639 brake-bars on the outside of the wheels, and arranged the levers
and connections, as I have already described it, in the other
truck.

Cross 175. When did you last see Isaac Newton Stanley, and is he living or dead, if you know?

A. The last I saw of him was about three years after he applied the brake, and, as I stated, in Greenwich street, New York. I have made diligent enquiry, and as far as my enquiry goes and my knowledge extends, he is dead; at the time he applied the brake, I should think he was fifty years old.

Cross 176. State, if you know, where he resided at the time he applied the brake, or when you last saw him.

A. I do not know where he resided at any time.

Cross 177. Will you mention the places and the persons where and of whom you have made the enquiries referred to respecting him?

A. In New York, in Philadelphia, and Baltimore. I made the enquiries of officers of railroads, and other persons whom I thought would be likely to know.

Cross 178. How near to three years after he applied the brake was it that you last saw him?

A. I could not define any more than my recollection carries me (and which I have testified to two or three times), that it was as near three years as can be, and that it was in 1845, as near as I can recollect.

Cross 179. When you saw him at this time, did you meet him accidentally?

A. I did; my business as superintendent of the cars brought me up Greenwich street at that time. I was going, I believe, to Ogden's yard for some mahogany.

Cross 180. Did you get the mahogany?

A No, sir; I did not get the mahogany myself; I always sent the carman for it: I made the purchase.

Cross 181. What was Ogden's first name?

A. The firm name was Brown & Ogden, at that time; I believe it is Ogden now.

Cross 182. Where did Brown & Ogden carry on business?

A. In Washington street; the yard runs from Washington to West; Ogden keeps the same place now.

640 Cross 183. You have in this deposition stated that you have no recollection of the brake which you put on to the car on the New Jersey Railroad ever being taken off; will you state, to the best of your knowledge, how long that car with that brake on continued in use, running on said railroad?

A. They asked me that question in Albany, on the trial at Albany of Henry Tanner against the New York and Erie Railroad, and I answered it; the question was asked, did it run a month; I said it did; and he asked me if it run two months; I said yes; and he asked me if it run three months; I said I believed it did; and he asked me then, to the best of my recollection, if it run six months; I said I believed it did; and he asked me if it run a year; I told him I couldn't say that; I have no recollection of its ever been taken off; I have asked as many as eight or ten different individuals on the road if they ever knew of its being taken off, and they said no; I would have gone into more of an explanation at Albany on the trial, but I was stopped by the counsel for Mr Tanner.

Cross 184. Question repeated.

A. Till the car wore out; when I left the road in 1849, to the best of my knowledge and belief, that brake and that car was on the road; I mean that car with that brake on was on the road when I left, in 1849.

Cross 185. How came you to be first spoken to about giving any testimony on this trial at Albany?

A. I don't know who it was that first spoke to me; the first I knew of it was a subpœna with my mileage; when we got to Albany the defendants were not prepared for trial, and they sent me back to New York to get a model of the car; I didn't get it, and I made one myself in Albany.

Cross 186. Do you know where that model is now?

A. I do not, sir. I know nothing about it.

Cross 187. What were the circumstances under which you first heard anything about that there was to be any trial at Albany, and the circumstances under which you were first spoken to about giving any information to the New York and Erie Railroad Company?

641 A. There were several people came to me to ask about the brake at different times; I know not who they were, and I did not know that there was going to be a trial until I received a subpœna and my mileage; Nehemiah Hodge was the man that conducted the case when I got in Albany; he said to me he wanted to kill the Tanner patent and to save his own.

Cross 188. After you did hear anything about there being a suit on the Tanner patent against the New York and Erie Railroad, with whom did you converse on the subject of double-acting brakes?

A. With nobody but Hodge and Carmel. I think he was from Dunkirk.

Cross 189. Do you mean that the several people whom you say called upon you, but whom you did not know, came to see you about the time of the suit against the Erie road?

A. They were there after me frequently, a year before the trial was—they, and other parties, too.

Cross 190. Cannot you mention the names of any of those persons?

A. No, sir; I never saw but one of them, to the best of my knowledge, and that was in Albany; and I told him that had I known that you were going to bring me here, I would not have told you what I did; he said, "I knew that, and that was the reason I kept it from you."

Cross 191. You say you made a model yourself in Albany; what was it a model of?

A. It was a model of the Stanley brake, with ball and chain, and two levers, with the connecting-rods tied together with strings.

Cross 192. How nearly was it like the Stanley brake, as you have described the latter in this deposition?

A. I believe there was this difference, that the trucks were both alike; they said they didn't care about the rock-shafts, all they wanted was the two levers, the connecting-rods, and windlass connected as I put the brake on; the ball and chain and the two levers under the body were in the model.

642 Cross 193. Then, you mean, do you, that the model, as you made it for the Albany trial, showed no rock-shaft in either truck?

A. It might have done so, but I think not.

Cross 194. In that model, where did you place the brake-blocks?

A. I think they were outside.

Cross 195. Was that the only model used at the Albany trial of the brake on the New Jersey Railroad, either as Stanley tried it, or as you tried it?

A. To the best of my knowledge, it was either as Stanley tried it, or as I tried it.

Cross 196. In addition to yourself, what other person testified at that trial in regard to this New Jersey Railroad brake, either as applied by Stanley or by yourself?

A. Frederick Boyes, Edward Beattie, Bernard Hughes, and Moses Parsels.

Cross 197. What did each of these persons testify to?

A. I cannot say.

Cross 198. Are you sure that Edward Beattie testified at that trial?

A. I am not sure, but I think he did; he was there, but I could not say whether he testified or not.

Cross 199. Can't you state anything about what either Hughes or Parsels testified to at that trial?

A. I cannot.

Cross 200. At the time of that trial, did Hughes and Parsels know the facts about the use on the New Jersey Railroad of the double brake, as Stanley tried it and as you tried it?

A. They did.

Cross 201. How well did they know them—how familiar were they with them?

A. They were familiar enough to testify in the case.

Cross 202. Did you hear each of them testify?

A. I don't know that I did; I think not.

Cross 203. Are you able to state what you yourself testified to on that trial?

A. I have answered that question, but I would like to make an explanation. I testified at Albany under peculiar circumstances.
643 M'r Sayles came to me before the trial came on and said to me
"M'r Talson, I know that you hold in your hand sufficient evidence to seriously injure my patent, or to kill it, but if you will not advance anything on this trial, and I win the suit, I will make you a very handsome present"; when I would begin to advance anything in explanation of the model I made, the counsel on his side would say to me he didn't want me to talk about that, he wanted me to talk about some other part of the model; the counsel for the railroad company didn't sustain me and I let it go without an explanation.

Cross 204. Having now succeeded in getting out the matter which you have so long, in this cross-examination, been waiting for a chance to state, will you be kind enough to answer the question I asked you, which was—are you able to state what you yourself testified to on that trial?

A. I ought to be, for M'r Mowry brought the evidence that I gave in Albany, and read it to me in the Merchants' Hotel, in Courtlandt street, and said he wanted me to testify to the same; I told him that I did not want anybody to dictate to me what I should testify to.

Cross 205. Question repeated—are you able to state what you testified to on that trial?

A. I cannot state word for word, but the substance was what I have testified to in this case—that is to say, as far as my knowledge extends, that Isaac Newton Stanley was entitled to that brake.

Cross 206. Is that all you can state, whether as to words, or as to substance of what you testified to at that trial?

A. I have answered that, already, in the foregoing question.

Cross 207. In what foregoing question have you answered it?

A. In answer 205, where I said, in substance, that Isaac Newton Stanley was the original inventor of that brake, to the best of my knowledge and belief.

Cross 208. Is this all that you can remember of what you testified to on that trial?

A. That was all the counsel asked me to testify on the Isaac Newton

Stanley brake; he asked me in substance, and I answered in substance.

644 Cross 209. Is that all you can remember of what you testified to on that trial—this, namely, "that Isaac Newton Stanley was the original inventor of that brake, to the best of your knowledge and belief"?

A. Yes, sir; that is what they employed me for, to testify to that.

Cross 210. You say that Mr. Mowry brought you the evidence, in Albany, and read it to you—can you remember what it was, as he read it to you?

A. I cannot; I told him I would not hear it—I did not want to hear it; I told him, then, the peculiar circumstances there was at Albany at the time the evidence was given; that was all that passed between M'r Mowry and myself at that interview.

Cross 211. Were the matters to which you testified at the Albany trial true?

A. They were, so far as they went.

Cross 212. How much do you now remember of what you testified to at that trial, respecting the facts and circumstances of your applying to the car the Stanley brake?

A. I made a statement that I applied the brake about six weeks after Stanley had done, with one lever instead of two; that is as near as I can tell now what I testified to.

Cross 213. Do you mean that it is all that you can now state that you testified to about it at that trial?

A. I believe that it is; for it has hardly entered my head since, I thought so little about the trial altogether.

Adjourned to the 16th of October, at 11 a. m.

WEDNESDAY, *October* 16, 1867.

Present, counsel for the respective parties.

Cross 214. Are you now able to state, since the adjournment, anything more than you have done, in regard to what you have testified to at the Albany trial?

645 A. On the Albany trial, they asked me my name, age, residence, and occupation, and if I knew anything respecting a brake put on the New Jersey Railroad cars by one Isaac Newton Stanley—I told them that I did, in the year 1842, in October. They asked me what kind of a brake it was—I explained to them the model that I had made of Stanley's brake; I tried to explain how Stanley applied his brake with two levers under the body of the car, with a ball and chain to bring those levers back after the brake had been applied to the wheels, and then I tried to explain how I modified his brake and strengthened it by taking off the two levers, putting on one in the centre, and likewise took off the ball and chain; but as soon as I attempted to explain the mode that I applied it, the counsel for the prosecution said he didn't want to hear anything about that; he would then point me to some other part of the model (which was the Stanley model), and said he wanted me to explain on that part of the model, and not what I was speaking about; they then called in, as an expert, Professor Mapes; the counsel asked him how much power it would require to move that chain and ball—he said it would take the power of a yoke of oxen to do it; I don't know that I can remember anything more; that is about the sum and substance of what I said except what I have stated before in this deposition.

Cross 215. At that trial, did you not testify, upon your examination, in chief, as follows: "I reside in Bergen, Hudson County, New Jersey; for fourteen years before the last three years, I resided in Jersey City; I was, during that fourteen years, superintendent of the car department on the New Jersey and Transportation Company"; and at this point, the model which you have referred to being shown to you, did you not further testify, upon such examination in chief, as follows: "That model exhibits a double-action brake, with lever in centre; each windlass acts on both brakes at the same time; the brakes were placed between the wheels, and were worked by the common rock-shaft, and were never changed to the outside of the wheels; a brake was put on like that Jersey model; a double-acting brake was first put on by Isaac Newton Stanley, on the New Jersey Railroad; Stanley put one on in 1842; 646 the brake he put on never went into use; it was so light and imperfect that it never answered the purpose; I threw all his gearing off and applied it mechanically, like the Jersey model; I took this brake and strengthened the rods and connections; Stanley's brake differed from the Jersey model in its levers; he had three or four levers in the middle; when I put on the brake, I added one transverse lever, the same as the model; I operated the brakes like this Jersey model; that brake ran on a car to Philadelphia, or opposite to it; it ran two or three times; it might have run more, it might have run less than three times; this was the Jersey model; I put this brake on in 1842; I am sure of this; Timothy L. Smith followed me in superintending that road; this brake was not put on any other car; Smith came in in 1844, and was opposed to this brake; before that, he was superintendent of the motive power; Smith wanted to put in Griggs' brake, from Baltimore, to act by a bumper; I can make a drawing of a car and build it; this Jersey brake would act on a curve; I never saw it in operation on a curve; this brake would not act so well on a curve as the plaintiff's; the mode of forming the connection between the brakes of the two sets of trucks is substantially the same in the Jersey model as in the plaintiff's brake; if you take out the arrangement of the Jersey model within the trucks and put in Tanner's within the trucks, you will have Tanner's brake; M'r Boyes had charge of the company's books at the time the Jersey model brake was made; I reported to Boyes what charges to make"?

A. I did testify so, down to where it says, "each windlass acts on both brakes"; I testified to the best of my knowledge and belief that one truck was fitted to the brake with a common rock shaft which broke betwixt the wheels; the other, the brake bars were outside the wheels; I am now speaking of the Stanley brake, not of my brake or the one I put on, because counsel would not allow me to explain my brake; the rest is as I testified, down to "like the Jersey model"; at the Albany trial, I stated that I put the brake-bars of the trucks on the outside of the wheels; at the end of that, counsel said that he did not wish me to explain that; I did not say that Stanley had three or four 647 levers in the middle of the car, because he never had but two; I said I reduced the levers to one in the centre of the car; I never said Timothy L. Smith followed me in the superintending of that road in 1844; Timothy L. Smith was on the road when I went there, in 1836, and he left the road before I did; what is said of Grigg's brake was done in the fall of 1849, and the early part of 1843; it was put on ten or twelve cars; Timothy L. Smith at that time was the superintendent of the motive power on that road; I think the part speaking of the action of the brake upon a curve, I don't remember stating that; with the exceptions I have stated, I testified as enquired in the question.

Cross 216. Who was the counsel, as you say in your last answer, told you he did not wish you to explain your brake or certain parts of your brake?

A. M'r Keller.

Cross 217. On your cross-examination at the Albany trial, did you not testify as follows: "Stanley's brake broke the first time it was tried; it was put together with rods; they came short, and we tried them with strings; I last saw Stanley two and a half or three years after this brake was applied; he said he had given up his brake and was not going on with it"?

A. I testified so with the exception of, it was "he" (Stanley) tried his brake, and not "we," and the reason he assigned, when I met him in Greenwich street, for not going on with his brake, was for want of means; if he had only had means, he said, it was the greatest thing out; I believe, to the best of my knowledge and belief, I testified at the Albany trial as I have now stated in this answer.

Cross 218. On said cross-examination at the Albany trial did you not further testify as follows: "From September, 1842, till January, 1843, we had no superintendent; after the brake ran a week it was changed to a single foot brake; I left the road in the last of August, 1849; Smith left in June or July, 1849; from the time I altered this to a single foot brake there were no double-acting brakes on the cars till I left the road that were acted on by a windlass at either end; there were double-acting brakes on the tenders, but they were not operated on by a
648 windlass at either end; the self-acting brake of Griggs was
never put on; within the trucks the Jersey brakes were different from Tanner's"?

A. I do not remember of ever testifying that we had no superintendent from 1842 to January, 1843; that about changing to a foot brake is a mistake; we were changing the foot brakes at that time to the windlass brake, and the blocks were put from betwixt the wheels to the outside; I think I never stated at the trial that I altered that brake to a single foot brake; I think, to the best of my knowledge, I did not state that there were no double-acting brakes on the road when I left; I believe that I made at that trial the statement that the Griggs brake was finished on one car, and the work was put on ten or twelve others, but the connections were never made; with these exceptions, I testified as enquired in the question.

Cross 219. On your redirect examination at the Albany trial, did you not testify as follows: "The brakes on the tenders could not be operated from both ends; the brakes on the tenders did not have the intermediate lever, and only a single connecting rod; Stanley's two experiments cost between two hundred dollars and three hundred dollars; one failed; the other ran to Jersey City; the brake I made was paid for by the company"?

A. I don't understand the part where it says, "the other ran to Jersey City," because the work was done at Jersey City, and that was the starting point for the cars; the rest is as I testified.

Cross 220. After testifying as above enquired about, were you not recalled at said trial, and upon being so recalled did you not testify that "after the trial of this brake we continued to use the single-acting brakes on all the cars"?

A. I do not remember anything of the kind.

Cross 221. Did you at or about the time that you saw M'r Thomas M. North and M'r George Gifford in relation to the matter with the Hudson River Railroad, testified to in your cross-answer No. 79, or at any time

say to M'r North that "the only double brake operated from both ends
of the car that you knew of up to the time you left the New Jersey
649 Railroad, in 1849, was the brake tried on the New Jersey road in
1842, and abandoned"?

A. To the best of the knowledge and belief, I never spoke to M'r North at all about the double-acting brake on the New Jersey Railroad no further than this: In my foregoing evidence I have stated that I made an affidavit respecting the Stanley brake and the one that I put on on the New Jersey Railroad; M'r Middleton, the gentleman who made the drawings on that instrument, and likewise wrote the instrument itself, told me to go to M'r North and M'r North would give me twenty-five dollars for my services; I went to M'r North, and he told me he should not give me anything, that M'r Middleton must pay me; and to the best of my knowledge and belief, that was all that passed between us at that time, and I have not spoken to M'r North since, to the best of my knowledge and belief; I would not know M'r North if I met him in the street, and I do not know that it was M'r North that I was talking to at the time, further than I was told.

Cross 222. Did you, at any time, in connection with this Hudson River matter, say to M'r George Gifford, that "the only double brake operated from both ends of the car that you knew of, up to the time you left the New Jersey Railroad, in 1849, was the brake tried on the New Jersey road in 1842, and abandoned"?

A. I did not, to the best of my knowledge and belief; as I have stated before, that I know nothing of the matter with the Hudson River road, and do not to this day; I don't know that they ever had a suit; I don't know anything about it; nor do I remember M'r Gifford ever speaking to me about that brake, except since I have been employed in this present case, before the taking of the evidence; M'r Gifford came to my house, in Hudson City; I was not at home; my wife told me that M'r Gifford had been to see me, and wished to see me in his office. Before I went to M'r Gifford's office, I went and saw M'r Stoughton, the counsel in this case; I asked him if there was any impropriety in my seeing M'r Gifford, the counsel against the railroads; he said there was none; he said, you are a man of discretion, and he said M'r Gifford was
a gentleman and would not take advantage of what I might say.

650 Cross 223. Question repeated.

A. To the best of my knowledge and belief, I did not.

Cross 224. Did you, at or about the time of the Albany trial, say the same thing to M'r Sayles, the complainant in this suit, and also to M'r Charles M. Keller, the plaintiff's counsel at that time?

A. I don't believe that I ever did to either of them; M'r Sayles put the words into my mouth more than once, twice, or thrice, but I did not say so.

Cross 225. Did you say the same thing to M'r Sayles about a year and a half ago, in Hudson City?

A. No, sir; I never did.

Cross 226. Have you said the same thing to M'r Sayles, at different times, between a year and a half ago and the time of the Albany trial?

A. I never did, neither between that trial nor any other time; M'r Sayles, I think, it may be about a year and a half ago, and it may be nearly two years ago, I received a note from him at the Astor House, to meet him at 11 o'clock that morning; I hurried myself and came down and met him at the Astor House; he says, "Talson, I want you to go to Chicago to testify in a suit that I have commenced in Chicago;" I asked him what was the suit; he said it was on the double-acting brake; I said to M'r Sayles, "it is time you and me now had an explanation betwixt us;" I said, "M'r Sayles, till you pay me what you owe me, honorably and honestly, I will not go one step for you;" he said, "didn't I give you five dollars in Broadway?" I said, "you never did;" he said, "come and go to Chicago and I will pay your expenses before you start;" he said, "you know very well that that brake on the New Jersey road was only an experiment, and that it amounted to nothing;" I told him that was not so; the facts in the case were decidedly against his patent, and if I went to Chicago I should so state.

Cross 227. You say, in your cross-answer No. 136, that you have been waited upon by different patent agents of brakes—M'r Sayles, M'r Hodge, M'r Stevens and others;-did you ever tell them, or either of them, what you have testified to in this deposition about the use
651 of double-acting brakes on the New Jersey Railroad, and about the brake you say you saw on the Tyler car in 1843?

A. I went into an explanation of the brake used on the New Jersey railroad, but I do not remember saying anything about the Tyler car-brake; I did tell them as I have testified in this case, as near as I can recollect.

Cross 228. You say, in your cross-answer No. 187, in answer to a question asked you about giving information to the New York and Erie Railroad Company, that several people came to you to ask about the brake at different times; did you tell those people what you have testified to in this deposition, about the brake on the New Jersey railroad, and about the brake on the Tyler car?

A. My answer is the same as to the preceding interrogatory.

Cross 229. Did you tell the same things to the other parties who came after you as you testify in cross-answer No. 189?

A. I told them, to the best of my knowledge and belief, the same in substance that I have done in this case; there was one man, I think, I spoke to about the Tyler brake, and told him, I think, that I could work that case up to his satisfaction.

Cross 230. Can you state the name of that person?

A. I cannot, sir? they were all strangers to me.

Cross 231. In your cross-answer No. 31, you speak of Erastus Reid being here one day, but leaving because his health was poor without giving his evidence; did he state to you then, or before then, what he could testify to about the use of a double brake on the New Jersey road; and if so, what did he tell you?

A. The first interview I had with M'r Reid, he said he well remembered Stanley applying the double-acting brake, and Stanley wanted to employ him; he said he remembered assisting in pushing the car down after Stanley had rigged his brake upon the car; and I asked him if he remembered when I strengthened the brake and put it on with a single lever, and he said he did; I asked him if he remembered the
652 brake being taken off that I put on; he said he did not, and he thought it was on the road when he left, and that was in 1849; that was in substance what he said.

Cross 232. Is not the Mead Rubber Company, by which you say you are now employed, unfriendly to the patent on which this suit is pending?

A. Not to my knowledge in any shape or form.

Cross 233. Had you not, prior to the time when M'r Whipple employed you in this case, as you have stated, lost a considerable sum of money in Pennsylvania or somewhere else?

A. I had not, sir.

Cross-examination closed here.

Attorney for defendant here states that he desires to adjourn till the 14th of November, 1867, and counsel for complainants assents upon the understanding that if, in the mean time, the witness should die, or for any reason be incapacitated from completing his deposition, that the deposition, as far as it has proceeded, shall be used in the case. Upon this understanding, the matter is adjourned.

MONDAY, *November* 18, 1867.

Present, counsel for the respective parties.

Direct resumed:

Q. 234. Since the adjournment in October, have you read your evidence, both direct and cross; if so, have you anything to explain, or any further matter or thing to add for the benefit of either the complainant or defendant in this case; if so, please state the same?

653 A. I have read my evidence, both direct and cross; some of the minor points might have been more fully explained, but the evidence that I have given in this case I believe is substantially correct.

Q. 235. In your evidence purporting to be given at Albany, in the case of Henry Tanner vs. The New York and Erie Railroad Company, tried at Albany, in 1854, you say, alluding to the Stanley brake, or rather the brake which you applied to a car on the New Jersey Railroad and Transportation Company's line, "that the brake (so applied) ran on a car to Philadelphia two or three times; it might have run more; it might have run less than three times." While it did run, did it do its work as efficiently, effectively, and practicably as a centre lever brake in use at the present time?

A. It did. It did it as effectually and efficiently, and as practicably as the centre lever brake does in use at this present time.

Q. 236. In what year was this brake so applied and operated, as above stated?

A. It was in the last of November, or beginning of December, 1842, as near as I can recollect—six weeks after Stanley applied his brake—and that date I got from the New Jersey Railroad Company's books.

Defendant's counsel now offers in evidence paper marked "Exhibit K."

Q. 237. Witness is now shown said exhibit, and asked, what does this represent, and is it the "instrument" referred in your answer to the 79th cross-interrogatory, and explained in answer to other cross-interrogatories which follow?

A. It is the instrument I referred to, drawn by M'r Richard Middleton, which M'r Whipple brought to me, as I stated in my examination in this case, when he asked me if it was my signature, and I told him that it was; and I would further state, that M'r Middleton told me that it was drawn by M'r Gifford. I now make the same affidavit as part of my present deposition, which is follows:

(Here follows a drawing of a Brake A, No. 1.)

654 This is to certify that a brake, answering to the description specified by the above drawing, was put onto the cars of the New Jersey Railroad and Transportation Company by Isaac Newton Stanley (whose residence now to me is unknown), according to date, October 20th, 1852, as the books of said company now show.

JOSEPH F. TALSON,

Superintendent of Cars of New Jersey Railroad Company, Jersey City.

(Then follows another drawing, marked "No. 2.")

B. This is to certify that a brake, answering to the description of drawing No. 2, was also put on to the cars of the New Jersey Railroad and Transportation Company by myself, in the year 1842.

JOSEPH F. TALSON,
Superintendent of Cars of New Jersey Railroad Company, Jersey City.

Witness says:

When this was signed I objected to the word "cars," as above, and wanted it "car;" M'r Middleton said it would make no difference in this matter; I was not superintendent at the time I signed this, but was at the time the brake was applied.

Q. 238. Please describe drawing No. 1 in said Exhibit, and tell what it represents more fully than described in the exhibit.

A. The drawing in Exhibit No. 1 is a drawing of Isaac Newton Stanley's brake, with two levers under the body of the car; the ball and chain were left off the drawing; Stanley's brake hooked in both hooks into one hole in the end of the lever; the ball and chain was at-
655 tached to that hole, the chain passing over a pulley to bring the
levers back again to their proper place after the brake has been applied to the wheels; his brake was applied by a rock shaft, with a long arm upon it, with a connecting rod and chain to the windlass or crank.

No. 2 is a drawing of the brake I put on, with the blocks outside the wheels instead of between the wheels, and the connections made with the centre lever at the end, with the connecting-rod running from that, connecting the lever on each truck, so that when we broke at either end of the car it would brake upon all the eight wheels at the same time.

The affidavit annexed to this exhibit is as follows:

STATE OF NEW YORK,
City and County of New York, ss:

Joseph F. Talson, being duly sworn, says that he was the superintendent of the cars used by the New Jersey Railroad Company for upwards of fifteen years, and that he continued to act as superintendent of said company until about the month of June, A. D. 1849. Deponent further says that the certificates signed by him, hereto annexed, are true of his own knowledge, and that said certificates are respectively marked A and B, and further deponent saith not.

JOSEPH F. TALSON.

Sworn to before me this 7th day of March, 1853.

LEWIS HURST,
Commissioner of Deeds.

Q. 239. Was this affidavit given before or after you testified in the case of Tanner vs. The New York and Erie Railroad Company?

A. It was given over a year before that.

656 Q. 240. (Witness is now shown Exhibit A and his attention called to the brake thereon, and is asked wherein it differs from that represented in drawing No. 2, Exhibit K.)

A. The difference is that in Exhibit A the connections to the centre lever are different; it had a leverage and fulcrum from eight to ten inches from the end of the lever; the levers in the truck Exhibit A are inside of the truck, and mine was on the outside.

Q. 241. Is the brake as represented in drawing No. 2, Exhibit K, and that on Exhibit A substantially the same in operation and effect, or are they different?

A. They are different; the mechanical arrangement is a little different, but the principle and effect is the same to the best of my knowledge.

Cross resumed by M'r Cozzens:

Cross 242. Did M'r Middleton make the drawing in Exhibit K?

A. He did; he made every particle of it just as you see it, and brought it to me.

Cross 243. In whose handwriting are the portions marked A and B called by you certificates?

A. I know no more than you, except that he (M'r Richard Middleton) told me that he made the drawings and wrote it himself; he used to be frequently in M'r Gifford's office and do a good deal of writing.

Cross 244. What did he tell you when he brought you that drawing?

A. He didn't tell me anything; he asked whether that was a correct drawing of Isaac Newton Stanley's brake, A No. 1; I said it was not, for there was no ball and chain upon it, and the connecting-rods were not connected at the extreme ends of the levers; then he asked me if B No. 2 was a fair representation of my brake with the clogs outside the wheels, and I told him that it did represent it very fairly, as I had previously explained it to him; I had showed Middleton the brake.

Cross 245. Did he say what was the object in making the drawing; if so, what did he say?

657 A. He said the drawing was made for M'r Gifford, and I have explained in my testimony that I was asked to give a mechanical opinion of those brakes in M'r Gifford's office, and I understood M'r Middleton that these drawings were to be used instead of the models, and that I never heard or said anything of this drawing from the day I swore to it until last December when M'r Whipple brought it to me; that is all I know about the matter.

Cross 246. Did you tell M'r North or M'r Gifford that the double brake put on the New Jersey Road by you, as you have stated in this deposition, was still on said road when you left there in 1849?

A. I never spoke to M'r North to the best of my knowledge and belief about the brake on the New Jersey Railroad or any other brake; I don't know M'r North; I don't know that M'r Gifford ever asked me any question about the brake on the New Jersey Road; all he asked me was a mechanical opinion of the models in his office, 17 Wall street.

JOSEPH F. TALSON.

Subscribed and sworn to before me this 18th day of Nov., 1867.

R. E. STILWELL,
Examiner, &c.

Defendant now offers in evidence model marked "Exhibit B."

R. E. STILWELL,
Examiner, &c.

Also model Exhibit C.

R. E. STILWELL,
Examiner, &c.

658 Also certified copies of Batcheldor & Thompson's application for a patent marked "Exhibit B 1."

Also certified copy of a patent to Henry Tanner, assignee of Lafayette F. Thompson and Asa G. Batchelder, for railway-cars marked "Exhibit C 1."

R. E. STILWELL,
Examiner, &c.

All this documentary matter objected to by complainant on the ground—

1st. That it relates to matter respecting which the defendants have no right to take testimony under the order opening the Interlocutory decree in this case.

2d. That it relates to a portion of the case already decided adversely to the defendants.

3d. That it is not in reply to anything elicited in the cross-examination.

659 Circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY Company.
} In equity.

Defendant's additional proofs.

660 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.
} In equity.

Testimony taken on the part of the defendant, under the 67th rule of the Supreme Court of the United States, as amended.

MONDAY, *September* 7, 1868.

Present, S. M. Whipple, esq., counsel for the defendant; Samuel Cozzens, esq., counsel for complainant, and complainant in person.

JAMES E. HUTTON, called and sworn as a witness on the part of defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. James E. Hutton; 47 years of age; reside at 49 Mercer street, Jersey City; and am an engineer on the New Jersey Railroad and Transportation Co.

Q. 2. How long have you been so employed?

661 A. I commenced work on that road on the 1st day of May, 1839, and was there till August, 1844; I left then and came back in July, 1845, and was there till January 8th, 1855; I then left and came back January 7th, 1856. I then left May 11th, 1856, and was gone until August 11th, 1863. I then returned, and have been there ever since.

Q. 3. Does the New Jersey Railroad run in connection with the Camden and Amboy Railroad; if so, at what place do the two roads connect?

A. They do; and connect at New Brunswick.

Q. 4. Do you know of the use of an engine on the Camden and Amboy road, known as the Ben Franklin; if so, when did you know it, and where did you see it?

A. I do; I knew it in 1844 or 1845, and saw it at New Brunswick.

Q. 5. Was it a new engine at the time you first saw it, and who built it?

A. It was a new engine, and built by Norris & Co., of Philadelphia, and it was called a Norris engine.

Q. 6. Was there anything peculiar about this engine from other engines in use on the road at that time which makes you remember it?

A. It was a larger engine and had more power than engines previously used on that road.

Q. 7. What circumstance enables you to fix the date of your first seeing it in 1844 or 1845?

A. Well, that is about the time I left the road, and I can't say positive whether it was there when I left or when I came back.

Q. 8. It was there at one time or the other?

A. I think it was.

Q. 9. Are you acquainted with the operation of what is known as the single-acting railroad-car brake?

A. I am.

Q. 10. Are you also acquainted with the operation of the kind of double-acting brake known as the centre lever connected brake?

A. I am.

Q. 11. Did the brakes in use on the cars of the Camden and Amboy Railroad from the time you first became acquainted with railroading, have a pawl and ratchet on the windlass staff?

662 A. They did not.

Q. 12. Did they use cranks, or wheels on the windlass staff in the early part of your experience in railroading?

A. They used cranks.

Q. 13. When the brake is applied to a single truck by a crank with no pawl and ratchet on the staff, will the crank fly around when the brakeman lets go of it, and would it be likely to hit any one who might be in the way of it?

A. I think it would.

Q. 14. If you were then to apply the brakes of both trucks, of a car connected by a centre lever attached to the body of the car between the trucks, would the crank fly round when let go, as in the case of the single brake?

A. It would.

Q. 15. If the opposite windlass from the one to which the brake was applied in the last named brake was not wound up, would the letting off the brake at the other end in any way effect the crank by causing it to revolve, if as I have said, not wound up?

A. No.

Q. 16. Suppose the cranks at both ends of the cars are wound up and one is let go of by the brakeman, would this crank revolve if the one upon the other end is held in the hand of another brakeman?

A. No.

Q. 17. But suppose this other or second brakeman let go of the crank he has hold of, in that case would the opposite crank be whirled around with greater or less force?

A. It would.

Q. 18. And would it hit the brakeman with greater or less force if any part of his person were within the range of the revolving crank?

A. It would.

Q. 19. Have you been examined on the part of the complainant in this case?

A. I have.

Q. 20. Were you cross-examined at that time on the part of the defendant?

A. No, sir.

663 Q. 21. I would then like to enquire, having in view your testimony given at that time, whether you know the year, and the day of the year which President Tyler took his tour over the Camden and Amboy road alluded to in your evidence?

(All cross-examination of this witness at this stage of the case objected to.)

A. I know it was the year 1843, but the day of the year I don't know.

Q. 22. Do you know what brakes were on the car which took President Tyler over the Camden and Amboy road in his tour North, as already alluded to, whether they were single or double brakes?

A. I didn't see the car that day; I don't know whether there was a brake at all on it; I was in Jersey City that day, and the car did not come further than New Brunswick, and I don't know whether there was a single or double brake upon it.

(Cross-examination waived by M'r Cozzens, counsel for complainant.)

JAMES E. HUTTON.

Subscribed and sworn to before me, this 7th September, 1868.

R. E. STILWELL,
Examiner, &c.

Edward T. Moore, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your age, residence, and occupation?

A. I am fifty-five years of age; I reside in Elizabethport, New Jersey; and am an engineer in the employ of the Central Railroad Company, of New Jersey, and have been employed by said company about 16 years.

Q. 2. Have you been examined in this case on the part of complainant?

A. Yes, sir.

Q. 3. Was there any one present at that examination on the part of the Chicago and Northwestern Railway Company, the defendant in this case?

664 A. I don't know of any one being present.

Q. 4. Did any one but M'r Sayles ask you any questions at that time?

A. I don't think there did.

Q. 5. Was M'r Whipple present?

A. No, sir.

Q. 6. Who first called upon you to get you to testify in this case?

A. M'r Sayles, the complainant.

Q. 7. What did M'r Sayles say he wanted of you, and what reply did you make?

A. I think he wanted to know what I knew of the Tyler car and the double-acting brake; I told him I knew the car and had seen it frequently; in regard to the brake I told him I could not say whether it had a double-acting brake or a single-acting brake; it had a crank on the end for the purpose of operating the brakes; I told him I didn't know much about it; that I didn't think I would be of much use to him; that it might have had a double-acting brake on, or it might not; I could not tell anything about it; I told him the first double-acting brake I saw, to notice it, was on the New Jersey Central road, which was about 16 years ago, in 1852 or 1853.

Q. 8. Did the cars of the Camden and Amboy road come over the New Jersey and Transportation Co.'s road in their joint business while you were in the employ of the said New Jersey road?

A. Yes, sir.

Q. 9. May there not one or more cars belonging to the Camden and Amboy road have come over the New Jersey road to Jersey City in the joint business of the two companies from time to time, from 1846 to 1851, with a connected centre lever brake thereon, which may have escaped your notice or observation?

A. I don't recollect seeing any there during that time; there might have been a double-acting brake on the road during that time and I not have seen it; I run the night mail train the latter part of the time I was on; I didn't run any Camden and Amboy cars when I run the Newark train.

665 Q. 10. Did you run the night train and Newark train all the time you were there, or did you run other trains?

A. No; I run the Brunswick train also; when any one was sick I would run their train; I run the Rahway train at one time; I was an extra engineer.

Q. 11. Were there any Camden and Amboy cars run in those trains?

A. Only in the Philadelphia train.

Q. 12. When did the Camden and Amboy cars commence running through from Philadelphia to Jersey City as a regular business?

A. I could not tell you now.

Q. 13. You have said in your testimony for complainant in this case that you knew the Tyler car from 1846 to 1851, and that you knew what brake it had on while you knew it, to wit, a single-acting brake; I will now ask, in view of the fact that you were not connected with the car department of the New Jersey road, and the long time which has elapsed, on reflection may you not be mistaken as to the kind of brake in use on the Tyler car while you knew it?

A. M'r Sayles asked me, and I told him it might have had a double-acting brake and it might not, and I say so still; I had nothing to do with the cars; I would not swear what kind of a brake it had on.

Q. 14. You have said in answer to the 16th direct question, which reads as follows: "Please state what brake it (the Tyler car) had on and how you know." To this question you answer: "It had a single-acting brake. It never had anything else but a single-acting brake on it while I knew it." Is that what you wish to be understood?

A. I wish to be understood that I don't know what kind of a brake it had on.

Adjourned to the 8th inst., at 11 a. m.

TUESDAY, *September 8th*, 1868.

Present, counsel for the respective parties.

Cross examined by M'r Cozzens, counsel for the complainant:

666 Cross 1. I understood you to say yesterday, though I believe it was not put down in the record, that you were employed on the New Jersey Railroad at a time prior to 1846. Is this so?

A. That is so.

Cross 2. About when then did you first go into the employ of said railroad?

A. About 1837, I think.

Cross 3. About how long did you continue in their employ at this time?

A. About three years, I think; at the end of that time I went to Bridgeport, Connecticut, and remained there about three years and a half; I was there at the time of the Bunker Hill Celebration, and then returned to the New Jersey road again about 1845 or 1846, and remained there I think till the spring of 1851.

Cross 4. While you were on the road between 1846 and 1851, how much of the time did you run the night mail train you have spoken of?

A. I didn't run it a great while; perhaps two or three months.

Cross 5. Was that the train which you referred to in your previous examination at the 9th answer on page 99 of the complainant's new proof?

A. Yes, sir.

Cross 6. What two or three months were these?

A. It was pretty cool weather; I could not tell what year; I went to Harrisburg in 1851, in the spring, and I run this night mail train the season before, I think.

Cross 7. How many Camden and Amboy cars were there in that night mail train while you so run it?

A. There was a platform car we carried the crates on, and a mail car, and generally three or four passenger cars.

Cross 7. Was this the train in which you had the the Tyler car?

A. Yes, sir.

Cross 9. If there had been double-acting brakes on those Camden and Amboy cars in that train, would you not have been likely to know it?

667 A. They might have had them on; I would not have been likely to have known it; I had nothing to do with the brakes.

Cross 10. Did you at that time know the difference between a single-acting brake and a double-acting brake?

A. No, sir.

Cross 11. When did you first learn the difference between those two kinds of brakes?

A. About 1853; that was the first one I ever looked at.

Cross 12. How came you to see one at that time?

A. My brother asked me if I had seen the new cars, (these were two new cars that came from Springfield,) and my brother asked me if I noticed the brakes; he took hold of the wheel and screwed it up, and I looked under the cars to see how it operated; I told him that was simple enough, and I thought it was a good plan; the brake operated on all the wheels from one windlass.

Cross 13. In all the time that you run that night mail train containing those Camden and Amboy cars, did you ever see or hear of any brake on any of those cars which operated on all the wheels from one windlass?

A. No.

Cross 14. How many brakemen were there employed on that night mail train?

A. It depended upon the length of the train; the platform car had what you call a caboose house for the brakemen to ride in; the baggage master always attended the brakes on his car; they didn't carry more than those two, except they had extra cars on.

Cross 15. While you were running that train did you ever have any difficulty in stopping at the right place at stations, or did you sometimes run by the stations?

A. No more than any other; we would sometimes run by the length of a car or so.

E. T. MOORE.

Subscribed and sworn to before me, this 8th September, 1868.

R. E. STILWELL,
Examiner, &c.

668 EMORY STEBBINS, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Emory Stebbins; 43 years of age; reside at Springfield, Massachusetts; and a cabinet-maker at present, and have been for the last year.

Q. 2. Have you ever been employed by any railroad company; if so, please state what company, how long you were employed, and what you did?

A. I have; by the Boston and Albany Railroad Company, formerly known as the Western Railroad Company of Massachusetts; I was employed from 18 to 20 years; for most of the time, say 12 years, I was inspector of cars at Springfield, Mass., at the depot of the company.

Q. 3. Do you understand the operation of the several kinds of brakes used on the cars on railroads; if so, name the different kinds with which you are acquainted?

A. I do understand them; the centre-lever brake, the Stevens brake, the Hodge brake, and the single brake.

Q. 4. Were all these different kinds of brakes which you have named in use on cars which came into the Springfield depot while you were engaged as inspector of cars, and did you operate all of them from time to time?

A. They were, and I did operate them.

Q. 5. After these different kinds of brakes which you have named have been applied to the wheels of the cars by turning up the brake-wheel or crank, will the wheel or crank revolve if no pawl or ratchet prevent, the instant the wheel or crank is let go of by the person at the windlass?

A. Yes, sir; they will.

Q. 6. Suppose you apply the centre-lever brake to the wheels of a car, or the Hodge brake, or the Stevens brake, there being no one at the opposite windlass in either of the above-named brakes, and the windlass or crank in either case be let go of, will the windless at the opposite end of either brake be revolved?

A. It will not.

669 Q. 7. But suppose in the application of the centre-lever brake by the brakeman, another person turns up the opposite wheel or crank, and then lets go (there being no pawl and ratchet on the back staff), will the wheel or crank in such case revolve?

A. It will not revolve.

Q. 8. Then suppose the brakeman who first applied the brake let go of his windlass, how will the opposite wheel or crank be effected, if the brake be a centre-lever double-acting brake, as already supposed?

A. It will turn and take up the slack of the chain.

Q. 9. Do you mean in this answer, to take up the slack or let off the slack that had been previously taken up?

A. It would let the brakes off the wheels; it would let the slack off.

Q. 10. Suppose it were a Hodge brake, or a Stevens brake operated in the same way as above stated, would the opposite wheel or crank be effected in the same way?

A. It would not.

Q. 11. Why not?

A. Because the slack is already taken up by the first man who puts the brake on.

Q. 12. Is there any slack in a Hodge or Stevens brake at the opposite end from which the brakes are applied?

A. None at all.

Q. 13. Is there a centre-lever brake?

A. There is.

Q. Is there any force on the opposite windlass of the centre-lever brake when the brakes are applied through the other windlass?

A. No, sir, there is not; it is perfectly loose at the time.

Q. 15. Is there any looseness of chain, rod or windlass in the Hodge or Stevens brakes at the opposite end from where the power is applied?

A. None at all

Q. 16. Can there be any reaction of the windlass in the Hodge or Stevens brakes at the opposite end of the car from which the brakes are applied when the brakes are let off?

A. None at all, I should say.

670 (The whole of this deposition objected to, so far as the same may be designed to apply to any question of infringement in this case.)

EMORY STEBBINS.

Subscribed and sworn to before me this 10th September, 1868.

R. E. STILWELL,
Examiner, &c.

Adjourned to the 11th inst., at 11 a. m.

SATURDAY, *September 12th*, 1868.

Present, the same as before.

WILLIAM COULTER recalled as a witness on the part of the defendants, deposes and says:

Q. 1. Do you understand the action of railroad car-brakes so far as the action of the crank or wheel used for applying the brakes is concerned?

A. I think I do.

Q. 2. Are you acquainted with the action of the crank or wheel used in operating the centre-lever double-acting brake?

A. I think I am.

Q. 3. You being a conductor, suppose your brakeman at one end of the car turns the crank or wheel of a double-acting centre-lever brake, and thus apply the brakes, and that you, at the other end of the car, turn the crank so as to take up the slack chain and then let go, will the crank you have let go of fly back if your brakeman still holds on to the other crank?

A. It will not.

Q. 4. Then suppose your brakeman lets go of the crank at his end of the car, how will his letting go effect the crank you had already let go of?

A. It would revolve rapidly to its place.

Q. 5. How do you know the crank would revolve rapidly to its place?

671 A. Well, I was once hit with it, and I have experimented with it since.

Q. 6. How do you fix the time you were hit, as stated in your former deposition in this case?

A. From the fact of my running a Philadelphia train as conductor: in my other evidence I think I stated it was in the fall of 1845, or spring of 1846; now I know it was in the fall of 1846; I was a little mistaken in my other deposition in regard to the time.

Q. 7. How do you know it was in the fall of 1846?

A. The conductor of the Philadelphia train, M'r Gamble, was engaged in Philadelphia as a witness in a lawsuit, and I was put on his train to run during his absence; the Newark train being my regular train at the time; I was put upon the Philadelphia train in the place of M'r Gamble for the time being, whose regular train was the Philadelphia train.

Q. 8. Have you any letter or anything of that kind by which you determine the date?

A. I have a letter which I received from M'r Smith at the time I was running the Philadelphia train spoken of, which is dated Nov. 17th, 1846.

Q. 9. And will you file the letter alluded to by you as an exhibit?

A. I have no objection.

Letter is hereto annexed and marked "Coulter's Exhibit."

(Letter objected to.)

Q. 10. You were running the Philadelphia train for M'r Gamble at the time you received this letter, and at the time you were hurt as testified to by you in your former deposition in this case?

A. It was during that week.

Q. 11. At what place did this occurrence of your being hit on the hand by the brake-crank happen?

A. It was on the morning train at Cambell's Station, which was then a stopping place for the Philadelphia train.

672 Q. 12. What circumstance, if any, caused you to be at the brake of any car or cars of that train?

A. We were about making a stop there, and I was on the rear platform of what we called the Tyler car. I thought he was going to run by, and I attempted to put the brake on; so I took hold of the crank and took the slack or chain up as far as it would go, and I didn't think it was holding any, so I let go of it, and after the cars had stopped I was standing on the platform, and when the crank revolved it hit me on the back of the hand, and it hurt me so that I felt it for a week or ten days.

Q. 13. Then your hand was not hold of the crank of the brake, was it?

A. No, sir.

Q. 14. Any pawl and ratchet on the brake-staff to hold the power?

A. I would not be certain about the staff; but there was no ratchet on the car. I had to hold the brake by main force; that is, those who applied it.

Q. 15. Did your brakeman make any remark at the time you were hurt, by his letting go the opposite crank, as you have stated?

(Objected to.)

A. Nothing more than he laughed at me, and said he had been knocked himself over the knuckles, or something like that.

(Objected to.)

Q. 16. On the same car?

(Objected to.)

A. I presume he meant so. I don't know.

(Objected to.)

Cross-examined by M'r Cozzens, counsel for the complainant

673 Cross 17. Did you ever know the crank or brake-wheel of a single-acting brake to fly back when it was let go after the brake had been put on?

A. I have.

Cross 18. Do you feel sure that your answer to the third direct question is correct?

A. I do.

Cross 19. Do you think what you say in that third direct answer would happen—did happen under the circumstances as you have stated them of your being hurt?

A. It did happen, just as I have stated.

Cross 20. Is it because—as you say—it happened, that you infer that the car spoken of had a double brake?

A. Well, I should judge so from the action I have seen since of double brakes; that is all.

Cross 21. Question repeated.

A. I judge it had. I infer now from that that it had a double brake on it.

Cross 22. That is all you know about its having a double brake at that time, is it?

A. That is all; the action of it.

Cross 23. You did not examine the brake, did you?

A. I did not.

Cross 24. When did you first know of your own knowledge, by actually seeing it, of a double brake acting at the same time on both trucks of the car from either windlass, being on any car either of the Camden and Amboy road or of the New Jersey road?

A. I could not judge about that distinctly. I should think about 1860; but can't tell.

Cross 25. You say in your seventh direct answer that M'r Gamble was engaged in Philadelphia as a witness in a lawsuit; how do you know he was?

A. I know it from the fact of his being subpœnaed, and will state the case if you want it. I know of his being subpœnaed from what he said; that is all.

Cross 26. How do you know that he went to Philadelphia as a witness; is it from his having told you?

A. That and other circumstances.

Cross 27. What other circumstances?

674 A. The circumstance of his going on the train with me.

Cross 28. Do you know that what he went to Philadelphia for was to be a witness, except from what he told you?

A. I know from that fact, and I have every reason to believe that he did go.

Cross 29. Is M'r Kester being away, as you say at this time, the reason that makes you think that the incident you have spoken of occurred in the fall of 1846?

A. Yes; M'r Smith, M'r Stebbins, and M'r Gamble went on to Philadelphia in the same case, and I got this letter I have produced from him at the time they were in Philadelphia.

Cross 30. Is your knowledge that M'r Smith and M'r Stebbins were engaged in this case derived from their telling you so?

A. Yes; from their telling me so, and the general knowledge I had of the case at the time.

Cross 31. Did you hear either of them testify in the case, or see either of them do anything in the case?

A. I did not.

Cross 32. Now, what connection has this letter with the crank of a brake flying back?

A. I received that letter some time during the week that I was hit with the crank.

Cross 33. Question repeated.

A. The first I ever ran on a Philadelphia train was during the week I was hit with that brake-crank; and that week I received that letter; and after that I went back to my regular train.

Cross 34. Then you mean, do you, that you think the letter shows when you were running the Philadelphia train?

A. Most certain.

Cross 35. Who was the M'r Kester spoken of in this letter?

A. He was the conductor running from Philadelphia to New Brunswick, and since dead.

Cross 36. Then it comes to this, doesn't it, that you think you remember that this crank flew around during the first week you run a Philadelphia train?

A. During the time I speak of; yes.

675 Cross 37. Have you never seen a brake crank fly around since that time?

A. Yes, sir.

Cross 38. About how many times?

A. Well, I suppose I have experimented myself ten times within the last two weeks. I have no recollection how many times.

Cross 39. Have you seen it fifty times?

A. I have no recollection.

Cross 40. Have you seen it twenty five times?

A. I have no recollection.

Cross 41. Have you seen it ten times?

A. I have as many as ten, and probably more.

Cross 42. What were these experiments you have been making the last two weeks?

A. With the different kinds of brakes.

Cross 43. What were you experimenting on with them; what were you trying to find out?

A. To see if any brakes in use on our road, except that centre-lever brake, or one on the same principle, would revolve after being wound up, the chain at the other end being wound up also.

Cross 44. Well, how did you find it to be?

A. I found that none of them would operate as it did on this Tyler car, except those on the same principle as the centre-lever brake.

Cross 45. Did you try any experiments with the single brake?

A. No, sir.

Case 46. At whose request or suggestion did you try those experiments?

A. My own.

Cross 47. Why did you want to do it?

A. I heard they were going to send for me again, and I wanted to be posted.

Cross 48. Prior to this two weeks, how many times did you see a brake crank revolve after the occurrence you think took place in the fall of 1846?

A. I couldn't answer how many times.

676 Cross 49. Can you state whether it was a great many times?

A. I have no definite means of telling anything about it. I haven't charged my memory with anything about it.

Cross 50. Have you seen it more than once?

A. I couldn't tell.

Case 51. Are you in the habit of often putting on the brakes at different times during the running of a train?

A. In case of necessity I do.

Cross 52. When did you first know, of your own knowledge, that this Tyler car had a double brake?

A. I don't know it yet.

Cross 53. Can you describe the construction and operation of double-acting brakes?

A. The operation from the platform; that is all, sir; the construction I know nothing about.

Direct resumed by M'r Whipple:

Q. 54. I will now take Exhibit A in this case, and assume that my right hand represents your brakeman and my left yourself; and then I will turn up the crank to the right with my right hand, and thus apply the brakes; with my left hand I will turn the crank to the left until the chain is wound up, and then let go. Does what I have done with my left hand correctly represent what you did before you were hit?

(Objected to as leading.)

A. I want to see the operation first. (The crank is let go, and witness says:) It does.

Q. 55. Then, did your brakeman let go of the other crank as I let go of this?

A. Yes.

Q. 56. And did the crank you had had hold of fly back and hit you on the hand as you have testified?

A. It did.

Cross resumed by M'r Cozzens:

677 Cross 57. At the time you say you were hurt you were trying to put the brake on, were you not, to stop the cars?

A. That is what I tried to do.

Cross 58. You tried to put it on with considerable force, did you not?

A. I tried to put it on with the force I ordinarily would use in putting on a brake.

Cross 59. That is, you were trying to make the brake-shoes press against the wheels to retard them, were you not?

A. Why, certainly.

Direct resumed:

Q. 60. Having applied the brakes, did you let go the crank by which you had applied them?

A. Yes.

Q. 61. And do I understand that the crank did not revolve when you let go of it, or fly back as you have stated?

A. It did not.

Q. 62. Is it not a fact that the cranks or wheels of all railroad car-brakes will fly back the instant they are let go of, if held by no pawl and ratchet, provided they are not held at the other end?

A. Yes, sir; all brakes that I have ever seen.

Cross-examined:

Cross 63. Is there the least doubt in your mind that, at the instant previous to your letting go of the crank, you had been trying to stop the car by making the brake-shoes press against the wheels?

A. There is no doubt.

Direct resumed:

Q. 64. Did the car to which you applied the brake in question run a short distance after you let go of the crank and before it flew back by the brakeman at the opposite end letting go of his crank? 678

A. A couple lengths of the train, I should think.

W. COULTER.

Subscribed before me this 12th September, 1868.

R. E. STILWELL,
Examiner, &c.

MONDAY, *September* 14, 1868.

Present, the same as before.

Adjourned to 2 p. m. this day.

Counsel on both sides present.

M'r Whipple wishes to note that he intended to resume the redirect examination of M'r Coulter this morning, but since the adjournment to 2 o'clock has been informed by M'r Coulter that he is sick and cannot attend, and therefore the case is adjourned to 11 a. m. to-morrow, as he has no other witness to examine to-day.

THURSDAY, *September 24th*, 1868.

Present, counsel for the respective parties, and complainant.

(All further testimony in this case on the part of the defendants objected to, as heretofore noted.)

WILLIAM COULTER, redirect continued:

Q. In view of all your evidence taken in this case, what will you have the court understand by your answer to the 52d cross-interrogatory, that is, "I don't know it yet;" that is, that this Tyler car had a double brake?

679 A. The same answer.

Q. Am I to understand that it was from not having examined the mechanism that you do not know that there was a double brake on the Tyler car?

A. I never examined it.

Q. Do you think there was a double brake on the Tyler car from the action of it at the time you was hurt in connection with its operation from the other end by your brakeman?

(Objected to.)

A. Only from what I have seen of the double brakes since.

Q. Is the action of the centre-lever double-acting brake now in use on the cars of the New Jersey Railroad and Transportation Company the same, under the same circumstances, as the action of the brake on the Tyler car, in *in* November, 1846, or the time when you were hurt?

A. They appear to be the same.

Q. Under the same circumstances, can you get the same action and reaction of the cranks or wheels of the Hodge brake or the Stevens brake?

A. I think not.

Q. Judging from the action of the brake on the Tyler car at the time you were hurt, and from what you know of the action of the centre-lever double-acting brake in use on the cars of your road, is there any doubt in your mind whether there was a connected double-acting brake on the Tyler car previous to 1847?

(Objected to.)

A. I have thought so from the action of the brakes I have seen from the platform since that time. That is all the means I have of knowing.

Q. Were there any Camden and Amboy cars run in the Newark train while you were conductor of that train?

A. No, sir.

Q. After you took charge of the Philadelphia train, as you say,
680 in April, 1848, was the Tyler car occasionally put in this train as
an extra car?

A. Yes, sir, it was.

Q. Did you ever have occasion to observe the action of the brake on the Tyler car after you were hurt?

A. No, sir; it was very seldom in the train.

Q. When you say in your direct evidence, taken August 15, 1867, that thereafter you were aware that the brake on the Tyler car did apply the power to both trucks at the same time, do you mean that you judge so from the action of the brake, and not from an examination of its mechanism?

(Objected to.)

A. My answer should have been, I was not aware of it; judging from the action from the platform, I think there was.

Cross-examined without noting the objections:

Cross. You have no knowledge, have you, what kind of brake was on that car in November, 1846, or afterwards?

A. No, sir.

Cross. Have you ever known the chain attached to the windlass of the double-acting centre-lever brake to catch so as temporarily to prevent the windlass or crank from flying back when the brake was let off?

A. Not particularly that brake; I have known chains to catch in that way; I don't know whether it was that kind of brake.

Cross. Have you known the chains to catch in this way with the kind of brakes now in use on the New Jersey Railroad?

A. Not of my own knowledge.

Cross. What brakes was it that you spoke of in your previous answer in which you had known the chain to catch?

A. I don't know what kind of brakes they were; but they were on the New Jersey road.

Cross. Have you observed this pretty often?

A. Not very.

681 Cross. About how often, as near as you can state?

A. I could not state any definite times; it depends upon circumstances.

Cross. Will it occur several times in the course of a year?

A. Well, I should judge it would on all the cars we are on; my knowledge of this mostly is from what I hear brakemen say.

Cross. Do you frequently have to call the attention of the brakemen to the fact that the brakes are not holding? and if you do, please state why.

A. I do; the reason is the fact of running by stations, and their answers are that the chains are too long or jammed.

Cross. What do you mean by jammed?

A. I mean it will catch around the shaft under the nut or eye when the brakeman applies the brakes.

Cross. And will it not also catch sometimes after the brake has been applied and when it is attempted to be let off?

A. It will.

Cross. When it so catches the chain will stay stationary, will it not?

A. It will until it works loose or is taken off by the hand in the majority of the cases, I think.

Cross. And when the chain thus stays stationary the wheel or crank on the windlass-staff will also remain stationary, will it not?

A. Yes, sir.

Cross. Are you able to state whether this same kind of "catching," with these same consequences, will take place with what is called the single-acting brake, acting on only one truck?

A. I should judge it would.

Cross. Are you able to state at all definitely how much of a distance the car on which you were hurt, as you have stated, ran after you let go the crank?

A. Well, I should judge two lengths of a train; I think there were six cars in the train, but am not positive.

Cross. Might not this distance be sufficient to allow of a brake chain which had caught working loose while the car was running this distance?

682 (Objected to.)

A. I could not judge.

Cross. In what distance have you known brake-chains which had caught to work loose?

A. I have never observed any, and have no means of knowing.

Cross. You have been asked several questions about the crank or windlass flying round; will you please answer this: After the brake-crank at one end of a centre-lever double-brake car; that is, I mean such brakes as are used on the New Jersey Railroad cars, has been turned so as to put the brake on hard if the brake at the other end is then put on with such force as you would employ to stop a car, and then the crank at this other end is let go, will not such crank at once fly back, provided, of course, the chain does not catch?

A. It will.

Cross. Then if, after this crank is let go, the crank at the other end is let go also, will there be any more flying back of any consequence in the crank you first let go of?

A. Very trifling—not of any consequence.

Direct resumed by M'r Whipple:

Q. Did the chain jam at the time you applied the brake when you were hurt?

A. That I could not tell.

Q. Do you think it did?

(Objected to.)

A. I could not tell.

Q. Is there a pawl and ratchet on the platform and windlass staff of the cars of the New Jersey road at the present time?

A. Most of the passenger-cars, if not all.

Q. How do you account for the non-reaction of the crank the instant you let go of it at the time you were hurt?

683 (Objected to because the witness having stated what occurred, according to his recollection, it is for the court to infer the reason. Question withdrawn.)

W. COULTER.

Subscribed before me this 24th September, 1868.

R. E. STILWELL,
Examiner, &c.

Adjourned to 10½ a. m. the 25th inst.

PHILADELPHIA, *Nov. 17th*, 1846.

DEAR SIR: I sent word last evening by M'r Kester to have the platform-car on which the crates are carried taken out of the train and one that was in good order put in its place, which was not attended to; if you delivered such orders to M'r Talson or Major, at Jersey City, it appears strange that it was not done. Tell one or the other of them this evening that if there is a like occurrence I will endeavor to have men that will obey orders—at least one of as much importance as that. Please see to the delivery of the accompanying letter.

Your friend,

T. L. SMITH.

W'M COULTER, Esq.

Coulter exhibit.

R. E. STILWELL,
Examiner, &c.

ALFRED HURD, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Alfred Hurd; 60 years of age; reside at New Brunswick, New Jersey, and am a locomotive engineer.

684 Q. 2. By what railroad company are you employed as a locomotive engineer?

A. The New Jersey Railroad and Transportation Company.

Q. 3. When did you first commence as locomotive engineer on that road, and to what time did you continue so employed?

A. About the year 1840, and continued till about 1850.

Q. 4. Where then did you go, how were you employed, and to what time were you so employed?

A. I went into the employ of the New York and New Haven Railroad Company as engineer, and continued in their employ till 1865; and since then have been in the employ of the New Jersey Railroad and Transportation Company.

Q. 5. Do you know anything of the application and use of a double-acting brake on a car belonging to the New Jersey Railroad and Transportation Company, during the time you were engineer on that road, from 1840 to 1853?

A. I know of one that was termed a double brake.

Q. 6. When did you, for the first time, see what was "termed a double brake" on that road?

A. I couldn't say exactly. It was in the administration of Joseph F. Talson, master wood-workman of the car department of that road.

Q. 7. How did this brake "termed a double brake" act?

A. It acted on both trucks instead of one, from either end of the car.

Q. 8. May not this brake have been seen by you on a car of the New Jersey Railroad and Transportation Company in the administration of M'r David H. Baker, and not that of M'r Talson who preceded him?

A. Well, that is rather a hard question to answer, as I have seen them in both.

Q. 9. Are you quite sure that you saw this brake "termed a double brake," during the administration of M'r Talson?

A. I am.

Q. 10. What was there about this brake that took your attention and caused you to notice it?

685 A. Well, it was no more than I saw one man could apply the brake to both trucks, and it would answer the place of two men.

Cross-examined by M'r Cozzens, counsel for the complainant:

Cross 11. What kind of a car was it which had on it this double brake?

A. It was a passenger-car; what train it run on or where it run I could not tell.

Cross 12. Did you ever before to day see M'r Sayles, who is now present?

A. Yes, sir.

Cross 13. When and where did you see him?

A. I have seen him at Jersey City. I couldn't tell the time.

Cross 14. State the time to the best of your ability.

A. I have seen the gentleman over there several times, but can't state the time.

Cross 15. Have these several times been within a year past?

A. I think so. I never knew his name. I knew his countenance.

Cross 16. Did M'r Sayles have any conversation with you at these times; and, if so, what was the conversation about?

A. No, sir.

Cross 17. Did you not tell him at least one of those times that you could not recollect anything about when double brakes were put on the cars of the New Jersey Railroad, and did you not tell this in answer to some conversation you had with him about it?

(Objected to, as the witness has said that he has had no conversation with M'r Sayles.)

A. No, sir.

Cross 18. Will you swear positively to this?

A. Yes, sir; for I never had any conversation at all with him about brakes.

686 Cross 19. How came you to see him?

A. He often came into our sitting-room; it is in one corner of the engine-house at Jersey City, and is called the engineer's room.

Cross 20. Do you know what he came there for?

A. No, sir. I had heard him mention something about double brakes, but he had no conversation with me.

Cross 21. Did he talk with anybody there when you were present; and, if so, who?

A. I couldn't say whether he directed his conversation to anybody in particular.

Cross 22. Mention who were present at any one of those times when you were there?

A. Well, I can't tell. Sometimes there were a dozen present, and sometimes a half a dozen.

Cross 23. Are you able to tell how this brake, which you say you saw, was constructed?

A. No, sir.

Direct resumed by M'r Whipple:

Q. 24. Do you mean it was a passenger-car that had this brake on or that it was a car run in a passenger-train?

A. It was a car that run in a passenger-train, as near as I can recollect.

Q. 25. Was it a car for carrying passengers or carrying baggage?

A. It was a car for carrying passengers.

Q. 26. May it not have been a car for carrying baggage?

(Objected to.)

A. It was always my impression that it was on a passenger-car.

Q. 27. And yet may it not have been on a crate or baggage car?

(Objected to.)

687 A. It might; but my best recollection is it was on a passenger-car.

ALFRED HURD.

Subscribed and sworn to before me this 11th September, 1868.

R. E. STILWELL,
Examiner, &c.

Adjourned to 2 p. m., the 12th instant.

Jonathan Edward Cudlipp, called and sworn as a witness on the part of the defendant, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Jonathan E. Cudlipp; 42 years of age next November. I reside between 69th and 70th streets, on 10th avenue, and am a carpenter.

Q. 2. Have you ever been employed by any railroad company? If so, state what company, how you were employed, and from what time to what time you were so employed.

A. I was employed by the New Jersey Railroad and Transportation Company, from April, 1843, until August, 1857. I served an apprenticeship at car-building in the shop, and run as conductor on the road, as extra conductor in case of sickness or absence.

Q. 3. How were you particularly employed in 1850?

A. In the car-shop, at repairing cars.

Q. 4. Are you acquainted with the complainant in this case, M'r Sayles? If so, please state when and how you first became acquainted with him, and the conversation connected with your first acquaintance or meeting, and then state what other meetings you had with him, and the subject-matter of such meetings.

(Objected to.)

A. I am. M'r Sayles visited my house the latter part of August, 688 1867. At his first visit I was on Long Island. My wife told him I would be home the next day (Saturday); M'r Sayles called on me that Saturday evening, about 8 o'clock, and introduced himself as M'r Sayles, and wanted to have a talk with me, to ascertain what knowledge I had of the Batchelder and Thompson brake, of which he said he was the owner. He wanted to get what knowledge I had of the John Tyler car, as fitted up by the Camden and Amboy Company. I told

him I had no knowledge of the John Tyler car fitted up by the Camden and Amboy Company. He further told me that he had some $50,000 to spend in this case, and that he was not going to be mean with it. I told him that I knew nothing of that John Tyler car, and didn't wish to be drawn in this matter at all. M'r Sayles said he understood that I was the only man that could influence M'r Joseph F. Talson. I told him I probably could influence him as much as any other man. He wished me to see M'r Talson in regard to this John Tyler car, and have a conversation with him, and see if I could not whet up my memory a little, and to ascertain about what evidence there was against M'r Sayles and his side of the question. I agreed to see M'r Joseph F. Talson in a day or two. That was about all the conversation we had at that time. I failed to go and see Talson at the time agreed. M'r Sayles called upon me, I think, on the following Tuesday or Wednesday. In a conversation we had at this meeting, M'r Sayles represented the value of this patent right in the neighborhood of somewhere from one to three million dollars, as near I can recollect, providing he gained the case, or gained the suit, that he had pending against railroad companies. M'r Sayles wished me to see M'r Talson, and if I could influence Tolson so far as to hold back what evidence he had collected for the railroad companies, and to go no further with his own evidence than to answer questions as they were put to him, that he would secure me to an income of ten per cent. of the whole income of said brake. Upon these conditions I was to see M'r Talson. I told him I could not go to see M'r Talson till the following Sunday, or I would write to him in the mean time. As M'r Sayles knew M'r Talson's place of business, he proposed my going to see him there. It was agreed that I was to meet M'r Sayles
689 at the Girard House on Monday morning, about 10 o'clock. I
met him at the time and place appointed. We then had a long conversation about the brake and about the evidence that Talson knew and had collected, and he there agreed to go before any lawyer in New York and secure to me this ten per cent. income from the brake which I have already mentioned. He took me down to Vesey street and showed me the office where Talson was employed. I went in (M'r Sayles stopped outside) and inquired for Talson. They told me that he was at that time in Baltimore, and would be home the next day (Saturday). I came out to M'r Sayles and agreed to see Talson on Sunday, and if I could see M'r Sayles on my return in the evening, at the Girard House, I would stop and tell him what my visit amounted to. He said he was going to Albany on Saturday, and would not be back till the following Monday or Tuesday, when I could see him at the Girard House. I went over on Sunday and saw M'r Talson (we being old railroad men together; I served my apprenticeship with him). We had a long conversation. He knew M'r Sayles well, and had known him for some years, and he said that M'r Sayles nor no other man had money enough to induce him to hold back what evidence he had secured, and in particular the evidence he had secured in Long Island; a witness that lived on Long Island. I think he represented that he was lame, or had been lame, injured in repairing a brake, or something like that. I had further conversation with M'r Talson at that time, but found it all amounted to nothing, as he was determined to give in his evidence as he had collected it. He said as far as the promise of the ten per cent. of the whole income from this brake was concerned, he would not give the snap of his fingers for the promise, or the agreement which M'r Sayles was prepared to make, or agreed to make, and I didn't consider it worth my while to go and see M'r Sayles on the Tuesday, as agreed. Further, I

would like to state here, when M'r Sayles said he would agree to give
me this ten per cent., which he thought would amount to the snug little
sum of somewhere about $100,000, that I was at liberty to divide it with
any one, or do as I choose with it. That was all about that. I
690 failed to meet M'r Sayles on Tuesday morning, according to agree-
ment. He came up and was at my shop about 12 o'clock on that
same day. I then told M'r Sayles that from the conversation I had had with M'r Talson, that I didn't think he had handled his case, as far as Talson was concerned, very skillfully, for M'r Talson had no confidence in him, and stated that M'r Sayles had treated him badly from beginning to end, and that I could do nothing whatever with Talson, and couldn't influence him one way or the other. I didn't see him again until the last of October, and our conversation amounted to about nothing at that time. I did not see him again until about midwinter. His whole conversation at that time was concerning this Batchelder and Thompson brake. We had quite a conversation about that brake, for up to that time I had claimed to have no recollection of the precise time when this brake was put upon the New Jersey Railroad. In the course of that conversation it struck me that I was injured pretty seriously while repairing a double-acting brake on a platform-car then running on that road. I told M'r Sayles that I was pretty confident that I was injured while repairing this same Batchelder and Thompson brake. He was anxious to know the time, and I stated it was about four or five weeks before I was married. I could not tell him positively the year I was married in, but stepped to the front window of my house and asked my wife the year we were married. She said it was the 29th of October, 1850; and furthermore she said I was hurt about five weeks before that time. That is the last time I saw M'r Sayles until I saw him here to-day.

(Objected to all that has been said to witness.)

Q. 5. You have said in the foregoing answer, "that we had quite a
long conversation about that brake (referring to the Batchelder and
Thompson brake), for up to that time I had claimed to have no recollec-
tion of the precise time when this brake was put upon the New Jersey
Railroad." Do you mean to be understood that it was the first time a
double brake was put upon said New Jersey road, or that it was the
first time you saw such double brake on said road?
691 (Objected to.)

A. No; I don't claim that it was the first double brake that was put upon the road, but being hurt at that time by repairing the brake, I know it was upon the road. How long that brake had been in use on that car, or road, I am not prepared to say.

Q. 6. What were you doing on said car, which you say had a double-acting brake thereon, and how were you hurt, in what way, and where?

A. The chain that goes on the standard or brake staff was too long. I had to take out three links out of that chain. When I returned from the blacksmiths' shop with the chain I connected it with the lever inside the truck frame, and was in the act of attaching it to the brake standard, when an engine backed up to the car with such force as to jam me between that and the adjoining car, and broke both of my collar bones.

Q. 7. Was this brake from which you took the three links of chain a connected double-acting brake that operated on both trucks of the car at the same time?

A. It was. We had no single-acting brake with an inside lever; that is, with no lever inside the truck frame.

Q. 8. How were the levers in each truck connected between the trucks so as to make a double-acting brake?

A. They were connected by a rod from a lever attached to the body of the car to a lever inside the truck-frame of each truck.

Q. 9. In this brake how were the windlasses connected?

A. They were connected by rods from the lever under the centre of the car.

Q. 10. Do you wish to be understood, then, that the rod with the chain attached, out of which you took three links, connected the windlass or brake-staff with the centre lever under the bottom of the car?

A. I do.

Q. 11. And not directly to the "lever inside the truck-frame," as you have stated?

A. Yes, sir.

692 Q. 12. During the time these meetings and conversations were going on between you and M'r Sayles, in reference to influencing M'r Talson in the course he was pursuing in eliciting evidence in this case, did any other person or persons call upon you to influence you to use your influence with M'r Talson? If so, please state the name of any such person or persons.

A. M'r David H. Baker, foreman of New Jersey Railroad car shop, called at my house on a Sunday afternoon; our conversation was about M'r Sayles and this brake.

Q. 13. What did he say to you in reference to your exercising an influence with M'r Talson?

(Objected to.)

A. M'r Baker said he thought there was some money in it for both of us, and if I could manage M'r Talson we could probably make some little out of it.

Q. 14. Did any other person call upon you on the same business as did M'r Baker?

A. No, sir.

Q. 15. While you were in the employ of the New Jersey Railroad, did you know of the use of a double-acting brake on any car or cars of the Camden and Amboy Railroad? If so, please state what you know, and any circumstances connected with such knowledge.

A. Yes; I know of double-acting brakes on the Camden and Amboy cars; I had to detach one at Rahway one night on account of its being out of order, and that was a double acting brake; but the precise time of that occurrence I am not prepared to state, but think it was in the time of Tolson having charge of the cars; I may be mistaken as to the time; it might have been after Baker came there.

Q. 16. Was it before or after the time when you were hurt in repairing the double brake alluded to in a previous answer?

A. I am not positive, but think it was previous to the time I was hurt.

Adjourned to 10½ the 9th inst.

693 WEDNESDAY, *September 9th*, 1868.

Present counsel and complainant, as before.

Q. 17. In answer to the 11th interrogatory, which reads as follows: "And not directly to the lever in the truck as you have stated," your answer is: "Yes, sir"; do you wish to add anything to this answer for the purpose of making it more explicit?

A. I wish to add that that chain was connected to a rod which was itself connected to a lever under the centre of the car; for I have stated heretofore that we had no single-brake with an inside lever.

Q. 18. In the brake in question, how was the lever on the truck located in reference to the centre lever under the body of the car?

A. Both were set nearest to the centre of the car or farthest from the front side of the truck.

Q. 19. You have testified that M'r Sayles said that he understood that you were the only man that could influence M'r Talson; how does it happen that you should have this supposed influence?

(Objected to.)

A. I suppose in no other way than my being an apprentice to him, and his being my brother-in-law.

(Objected to.)

Q. 20. At your first conversation you told M'r Sayles that you knew nothing about the John Tyler car of the Camden and Amboy road; but notwithstanding this, you say that M'r Sayles wanted you to see M'r Talson about this car; see him about what, in relation to the Tyler car? Please explain.

A. I had mentioned the Tyler car on the New Jersey road fitted up at the time of John Tyler's marriage; probably M'r Talson had that
mixed up with the John Tyler car of the Amboy road; I should
694 have said that M'r Sayles thought that M'r Talson had that car
mixed up with the John Tyler car of the Camden and Amboy
road; and this is what M'r Sayles wanted me to see Talson about at the time.

Q. 21. You have further testified that M'r Sayles wished you to see M'r Talson, and if you could influence him to hold back what evidence he had collected for the railroad companies, and go no farther with his own evidence than to answer questions as they were put to him; please be a little more explicit on this point, and state how he was to answer.

A. Well, from the conversations we had, I suppose he meant Talson to answer yes or no, to the questions put to him, and add nothing farther to them.

(Objected to.)

Q. 22. You have further testified that M'r Talson said as far as the promise of the ten per cent. of the income from this brake was concerned, he would not give the snap of his finger for it, for the promise or the agreement which M'r Sayles was prepared to make or agreed to make. Why this seeming indifference on the part of M'r Talson to the proposed agreement of M'r Sayles? Please explain more fully.

(Objected to.)

A. M'r Talson considered his case helplessly lost from the evidence already given in, and he would not enter into such an arrangement with M'r Sayles or any other man.

(Objected to.)

Q. 23. What do you mean by the Batchelder and Thompson brake spoken of by you in your evidence?

A. A brake rigged with a lever in each truck and connected with a double-acting lever under the centre of the car.

695 Q. 24. Was there such a brake on the car you were repairing at the time you were hurt, alluded to in your foregoing evidence?

A. Yes.

Adjourned to 10½ a. m. the 10th inst.

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THURSDAY, *Semtember 10th*, 1868.

Present counsel as before, and complainant in person.

Cross-examined by M'r Cozzens, counsel for the complainant:

Cross 25. You have stated that you are the brother-in-law of Joseph F. Talson; were you aware when you testified here yesterday, and the day before, that the said Talson is at the present time under bail and awaiting an examination on a charge of perjury in this suit?

A. I was aware of it, but I didn't know but it was settled, as I have had no conversation with M'r Talson about it.

Cross 26. From whom, or how, did you hear about it, and when?

A. Shortly after his being brought from Chicago to New York; he came to see me at that time and stated he would probably want me in September as a witness in this perjury case; I have not heard anything from it from that day to this.

Cross 27. Were you aware that this charge of perjury was made at the instance of M'r Sayles, the complainant in this case?

A. So Talson told me at that meeting.

Cross 28. (Without waiving the objections heretofore made.) Were not the matters you have testified to in answer to the 4th direct interrogatory, or some of them, talked of at the time you met M'r Sayles at the Girard House, as you say?

A. Yes, there was a conversation with Sayles and me at the Girard House, and I think they were talked over.

696 Cross 29. Did you meet M'r Sayles at the Girard House on more than one occasion?

A. No, sir.

Cross 30. Was any one present at that conversation at the Girard House besides M'r Sayles and yourself?

A. There was another gentleman that sat alongside of M'r Sayles, and he went with us as far as Vesey street.

Cross 31. Was his name Wandell?

A. That I could not say.

Cross 32. Was there any body else besides that party present?

A. Only a little boy of mine.

Cross 33. In that Girard House conversation did you not say to M'r Sayles in the presence of the gentleman you have mentioned, that when you first went on the road you heard about the old Stanly brake being tried and failed, and being taken off the car, and being put up over head in the loft or chamber of the car repair-shop of the New Jersey Railroad, and that you saw it there a good many times?

A. It is probable I had such a conversation at that time or some other with M'r Sayles about the Stanly brake.

Cross 34. Did you not further say in that conversation that you knew there was no double brake, or that there was no double brake used on that road (the New Jersey road) before Baker put the double brakes on in 1850 or 1851, or you would have seen it, and that you knew you never saw a double brake before Baker put one on?

A. I don't think I had ever repeated anything of the kind, as I always maintained, even with M'r Sayles himself, that there was double-acting brakes on the road during M'r Talson's time; the dates I could not say, nor the particular arrangement of the brake.

Cross 35. Do you mean by the last part of this answer that you wish to say what you said in your direct examination respecting your seeing or knowing of double brakes on the New Jersey Railroad?

A. No, sir.

Cross 36. Did not Sayles say to you in that conversation that
697 he wanted some one to look up the facts with regard to the use of double brakes on the Camden and Amboy Road, and on the New Jersey Road, and to look up witnesses to prove those facts, and that he wanted some one who was smart and acquainted with the men who were on those railroads from 1842 to 1851?

A. I can't recollect exactly about that conversation, he impressed me with the idea of getting facts from Talson.

(This sentence objected to.)

Cross 37. At that conversation did he not show you Talson's testimony given at the Erie trial in 1854, and did he not tell you that he had had no doubt that that testimony was true, and did he not tell you that all he wanted of Talson was to stick to what were the facts as he (Talson) had himself testified to them at said trial, or words to that effect?

A. Yes; M'r Sayles read over, I think, a portion of M'r Talson's testimony at Albany, which I paid very little attention to. He did wish M'r Talson to stick to facts. That was about the amount of our first meeting.

Cross 38. At the Girard House conversation was not what M'r Sayles said to you about the ten per cent. proceeds of the patent this, that he wanted somebody to help him prove the facts in the case, and that if you would help him to look up witnesses to prove these facts, and that if he succeeded in the case he would give you ten per cent. of the nett proceeds of the patent?

A. I think not; as I would not have had anything farther to do with it from that moment. In his conversation about Talson, both at the Girard House and on the way to Talson's office from the Girard House, that he wanted nothing but facts from Talson, and to keep back what evidence he had secured for the railroad companies.

Cross 39. Was this same person who was present at the Girard House when you had the conversation with M'r Sayles with you when you walked to Talson's office?

A. I think not; or he probably walked behind us, as he had some business at the Erie Railroad depot, in Jersey City. It is my impression that he went down Chambers street to the ferry, but it is only a supposition; I can't be positive. 698

Cross 40. You mean, I suppose, that it is your impression that as you were leaving the Girard House to go to Talson's office that that person went down Chambers street to the ferry?

A. Yes, sir.

Cross 41. It is possible then, is it, that he did not do so, but that he accompanied M'r Sayles and yourself to Talson's office?

A. No; because he did not accompany us to his office. He either left us at Chambers street or at Vesey. I am not certain that he followed us; if he did, he was behind us.

Cross 42. In the Girard House conversation did not M'r Sayles say to you that he had all the railroads in the country against him in this case, and that the facts in the case would have to be proved by railroad men, and that these men would probably be afraid to testify to these facts for fear of being discharged by the roads; and did he not tell you that these men would talk to you more freely than to himself, because you were an old railroad man and acquainted with the men who knew the facts, or words to that effect?

A. I think that conversation took place at our first meeting, which was at my house. I did not understand that I was to influence or get any testimony from any man except Talson. We may have had such a conversation as the question enquires of at the Girard House, but am not positive about that part of it.

Cross 43. Did you not, at that Girard House conversation, say to M'r Sayles that if there had been any double brakes on the Camden and Amboy cars which came to Jersey City while you were on the New Jersey Railroad, you would have seen them, and that you were sure that you never had seen one before M'r Baker put the double brake on the New Jersey Road, and that that was some time after you were hurt, which was in 1850?

A. No, sir; as I never spoke to M'r Sayles about my being hurt on the New Jersey road until February, 1868; then in M'r Sayles' conversation he brought to my mind the brake that I was repairing at the time I got hurt. This conversation took place at the coal-office, corner of 70th street and 10th avenue. 699

Cross 44. Did you say the things enquired about in the question other than about your being hurt?

A. At one of our meetings I recollect a conversation when I stated that I had no recollection of the John Tyler car or any double brake on the Camden and Amboy cars during Talson's time.

Cross 45. Is it not possible that you may have said this at the Girard House interview?

A. Yes; it is possible.

Cross 46. Did you not state to M'r Sayles at the Girard House, that if there had been for any length of time any double brakes on the Camden and Amboy cars which came to Jersey City while you were on the New Jersey Railroad you would have seen them?

A. I think it most likely I said so.

Cross 47. Have you any recollection of any double brake on the cars of the New Jersey Railroad, or on any Camden and Amboy cars prior to the time referred to in your direct examination, when you say you were injured?

A. No distinct recollection of the workings or arrangements of double-acting brakes, but there had been double-acting brakes used upon the road of different kinds.

(The last part of this answer objected to.)

Cross 48. Will you look at the sketch now shown you and state whether or not you made it?

(All questions from cross-question 28 up to this question put de bene.)

A. I may have drawn a sketch similar to that, but it was on the blank leaf of a bound novel which lay upon the top of a coal scales. I don't think I drew that.

Cross 49. Did you not make a second sketch for M'r Sayles, and is not this such second one?

700 I think not; I referred to that sketch, and I stated to M'r Sayles that I thought my evidence in the patent-brake case would injure him; would not help his side at all.

(The last part of this answer objected to.)

Cross 50. For what did you draw the sketch which you say was similar to this one now shown you?

A. As the occurrence of my being hurt had just entered my mind, I had not the time to give M'r Sayles any correct draft of it; I wanted to convey some idea to M'r Sayles what that brake was that I was repairing when I was hurt.

Cross 51. When you say a "correct draft," do you mean an artistically executed drawing of it, such as a draftsman would make?

A. No, sir; for I am no draftsman; but one that would fully represent the connections of said brake.

Cross 52. When was it, as near as you can state, that you made for M'r Sayles the sketch similar to this one?

A. It was about the middle of the winter of 1867 and 1868.

(The sketch annexed, marked "Cudlipp's Exhibit," defendant's new proof.)

Cross 53. Will you state what the portion of this sketch underneath the car-body, and next to the words and figures, "February 27, 1868," represents?

A. I suppose it represents the support of the windlass.

Cross 54. You have stated that M'r David H. Baker called upon you; did you not state to him at this call that you had no knowledge of any double brake on the New Jersey Railroad previous to the time of his putting the double brake on said road?

De bene:

701 I made no acknowledgements either one way or the other to M'r Baker, as I did not wish to be brought into this matter at all; I think our whole conversation was upon the present condition and management of railroads; I mean I did not say so to M'r Baker.

Direct resumed by M'r Whipple:

Q. 55. Has this exhibit, marked "Cudlipp's Exhibit," any connection with the brake which you were repairing at the time you were hurt, or not? Please explain.

A. No, sir; as the brake upon which I was at work when I was hurt had a rod running over the top of the truck connecting with the chain from the standard, the other end of the rod was connected to a lever in the centre of the car, or between the trucks.

Q. 56. Do you know anything about this exhibit?

A. I do not.

Q. 57. On the back of said exhibit is marked "Cudlipp's brake;" is that your handwriting?

A. No, sir.

JONATHAN EDWARD CUDLIPP.

Subscribed and sworn to before me this 10th September, 1868.

R. E. STILWELL,
Examiner, &c.

702 In the circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.

Deposition of witness produced and examined on behalf of respondents, before William Grier Hibler, United States commissioner and examiner, at his office, No. 435 Library street, in the city of Philadelphia, on the 29th day of September, A. D. 1868; M'r S. M. Whipple attending on behalf of respondent and the plaintiff in person, and M'r S. D. Cozzens attending on behalf of complainant.

JOSEPH W. BAMPTON, being produced and duly sworn on behalf of the respondent, deposes and says, in answer to interrogatories (the same objection to the taking of this deposition as was made to the depositions taken in New York; that is, that it is taken after 20th September, 1868, and therefore irregular):

Q. 1. What is your name, age, residence, and occupation?

A. Joseph W. Bampton; aged 37 years; reside at 3154 Frankford road, and am a bookkeeper by occupation, for Camden and Amboy Railroad Company.

Q. 2. Have you charge of the vouchers and pay-rolls of the Camden and Amboy Railroad Company?

A. I have, at the Philadelphia office.

Q. 3. Are all the vouchers and pay-rolls for moneys paid to engineers, firemen, and brakemen sent to the Philadelphia office for payment and preservation?

A. They were all sent previous to 1863; the vouchers on file previous to 1863 are on file at the Philadelphia office.

703 Q. 4. Have you examined all the vouchers for moneys paid by the Camden and Amboy Company for the year 1843?

A. I have; all those that are on file at the Philadelpia office.

Q. 5. Do you find among the vouchers so examined the name of William Quigley?

(Objected to.)

A. There is no such name on the rolls or on any vouchers.

Q. 6. Is there any other depository of vouchers for moneys paid by the Camden and Amboy Company to engineers, firemen, and brakemen than the Philadelphia office?

A. None other previous to 1863.

Q. 7. Have you examined the vouchers and pay-rolls of the Camden and Amboy Railroad Company for the year 1847?

(Objected to.)

A. I have examined the vouchers of the Philadelphia and Trenton Railroad Company, which was run by the Camden and Amboy Company, in the year 1847.

Q. 8. Do you find on the pay-rolls of that company, in the year 1847, the name of William Quigley; if so, how was he employed?

(Objected to.)

A. Yes, I did find his name; he was employed as brakeman.

Q. 9. What time in the year?

(Objected to.)

A. In August; he was there the whole of the month of August.

Q. 10. Do you find him employed as brakeman at any time in the year 1847, prior to the month of August?

704 (Objected to.)

A. I do not.

Q. 11. Was he continued as brakeman on said Philadelphia and Trenton road the remainder of the year 1847?

(Objected to.)

A. He was.

Cross-examined by M'r Cozzens:

Cross 1. How long have you been bookkeeper for the Camden and Amboy Railroad Company?

A. About 10 or 12 years.

Cross 2. Is that all the time you have had charge of the vouchers and pay-rolls you speak of?

A. That is all; I could have had access to them previous to that.

Cross 3. Do you know in whose handwriting are the vouchers and pay-rolls which you say have been in your charge for the last 10 or 12 years?

A. I recognize the handwriting in some of the pay-rolls; in others I do not.

Cross 4. Are there any of them in your handwriting?

A. No.

Cross 5. Do you know of your own knowledge that every voucher and pay-roll for every payment, whether small or great, to every engineer, fireman, and brakeman employed upon the Camden and Amboy Railroad since the year 1843, have been preserved, or do you only suppose so, because such is the design of the company?

(Objected to.)

A. I know that they are all preserved since 1843.

Cross 6. How do you know it?

A. I know that I have access to all the cases; there is a case for all the vouchers for each year.

Cross 7. How do you know that all the vouchers that belong to a particular year or years are in those cases?

705 A. I suppose they are, from the best of my knowledge and belief.

Cross 8. Then is your reason for supposing that they have all been preserved since 1843 this, that cases are kept for the vouchers for each year, and you suppose that all the vouchers belonging to each year are contained in these cases?

A. Yes; that is my reason.

Cross 9. Then you cannot know positively, can you, that every single voucher or pay roll that belonged, for instance, to the years 1843, 1844, 1845, and 1846, which was prior to your having charge of the vouchers and pay-rolls, ever got into or are still in the cases?

A. I cannot say positively; but I suppose that they are in those cases.

(The last clause of the answer objected to.)

Cross 10. Do you know positively that in the years 1843, 1844, 1845, 1846, vouchers for every single payment to every engineer, fireman, and brakeman, were made and kept by the Camden and Amboy Railroad Company?

A. I do not know positively.

Cross 11. When did you go into the employment of the Camden and Amboy Company in any capacity?

A. About the year 1850.

Cross 12. What were your duties when you were first employed by them?

A. Ticket agent.

Cross 13. How long did that continue to be your duty?

A. I think two or three years.

Cross 14. Where was the office where you performed those duties for these two or three years?

A. At Philadelphia; at the same office where I now am.

Cross 15. After those two or three years, what did you next do for the company?

A. I then had charge of what are called the abstract books of the passenger receipts. After that I became bookkeeper.

706 Cross 16. What vouchers and pay-rolls of the Camden and Amboy Company do you now have charge of?

A. I have only charge of the current bills for the month that are paid at the Philadelphia office; then they pass out of my hands.

Cross 17. Do you have to enter in your books the amounts of the vouchers and pay-rolls ?

A. Yes.

Cross 18. After you have so entered them, do the vouchers and pay-rolls pass out of your hands ?

A. They do; I send them monthly to the auditor. They are not afterwards returned to me. This arrangement has been in force since about 1863. Previous to that I had charge of them from the time I commenced being bookkeeper. Since 1863 they have been preserved at Trenton, New Jersey.

Cross 19. While you were ticket agent, and while you had charge of the abstracts of passengers' receipts, I understand you to mean that you did not have any charge of the vouchers and pay-rolls; am I right ?

A. I had no direct charge of them, but had frequent access to them.

Cross 20. I understand you to mean your third cross-answer to apply to the pay-rolls which belonged to the years prior to the last 10 or 12 years, when you commenced to be bookkeeper; am I correct in this ?

A. Yes; I do know some of them, and some of them I do not.

Re-examined:

Q. 12. For the time that you have been in the employ of the Camden and Amboy Railroad Company, what has been the established usage of said company as to the preservation of its vouchers for money paid to any person or persons ?

(Objected to.)

707 A. The established rule is that all vouchers be entered in a book, and then properly endorsed, and then filed away in the case for each year.

Q. 13. Can any person or employee obtain any money from the Camden and Amboy Railroad Company without signing a voucher for the same ?

(Objected to.)

A. Yes; they can. For some of the vouchers we don't take receipts; they are witnessed by some one person for the whole roll; but the names of the employees are in this pay-roll, witnessed by this person.

Q. 14. Must there be a voucher or a witness of the payment of money to obtain it ?

(Objected to.)

A. In all cases there must be a voucher of one or the other of these kinds.

Q. 15. And those vouchers, by a rule of the company, are all preserved, are they ?

(Objected to.)

A. Yes, sir.

Q. 16. Filed away, each in its appropriate year ?

(Objected to.)

A. Yes, sir.

J. W. BAMPTON.

Subscribed and sworn to before me this 29th day of September, A. D. 1868.

W. GRIER HIBLER,
U. S. Commissioner.

708 **Friday**, *September 25th*, 1868.

Present, counsel for the respective parties, and complainant.

Robert C. Burgby, recalled as a witness on the part of the defendants, deposes and says:

Q. 1. Have you been time keeper on the Camden and Amboy road for the last 25 years and more?

A. I have.

Q. 2. Do you know William Quigley, now running a locomotive on the Camden and Amboy road?

A. I do.

Q. 3. How old a man do you take him to be?

(Objected to.)

A. About forty years.

Q. 4. Was he born and brought up in Bordentown?

A. He was.

Q. 5. Did you know him twenty-five years ago—say in the year 1843?

A. I did not; I have no recollection of him.

Q. 6. He has testified in this case that he was employed as fireman for the Camden and Amboy Railroad Company in the years 1844 and 1845; is there any evidence on the engineer's and fireman's time-book kept by you that he was so employed in those years?

A. There is none whatever.

Q. 7. Could any man get pay from the company unless his name was on the time-book?

(Objected to.)

A. Not as engineer or fireman.

Q. 8. Was William Mathews an engineer on the Camden and Amboy road in the years 1844 and 1845?

A. He was not.

709 Q. 9. According to the time-book of the company, when did he first become engineer on that road?

(Objected to.)

A. He first appears as engineer October 11, 1847.

Q. 10. Is there any evidence on the engineer's time-book of his being employed as engineer before that time?

(Objected to.)

A. There is not.

Q. 11. Are the entries there made in your own hand?

A. They are.

Q. 12. Did William Quigley ever fire for W'm Mathews according to the records of time kept by you?

(Objected to.)

A. He did not, as appears by my second Exhibit A 3.

Q. 13. Did he ever fire for Charles Yundt, engineer?

A. Not to my knowledge.

Q. 14. When does William Quigley first appear on your books as fireman for the Camden and Amboy Railroad Company?

(Objected to.)

A. Referring to book Exhibit A 4, January 1st, 1849.

Q. 15. Who did the said Quigley fire for in January, 1849?

(Objected to.)

A. Lewis Holland.

Q. 16. Are the names of Lewis Holland and William Quigley entered in Exhibit A 4 in your own hand as engineer and fireman?

A. They are.

710 Q. 17. Was William Quigley then entered upon the book as regular fireman, reference being had to the book kept by you ?

(Objected to.)

A. He was.

Q. 18. Did he fire every day as regular fireman—that is, when the engine he fired was in use ?

A. He did.

Q. 19. Is there any record that he was fireman for the Camden and Amboy Railroad Company before January, 1849 ?

(Objected to.)

A. There is no record that I can find on any of the books.

Q. 20. From your best recollection was William Quigley brakeman on the Camden and Amboy road in the year 1847 ?

A. He was not.

Q. 21. Was he brakeman for the company in the year 1843 ?

A. Not to my knowledge.

Q. 22. Do you recollect of his being about the shops of the company at Bordentown in the year 1843 ?

A. I don't remember ever seeing him about there; never there to my knowledge.

Q. 23. Did the Camden and Amboy Company employ any boys on this train in the years 1843, 1844, 1845, and 1846 ?

A. With one exception I never knew them to employ a boy; I knew them to employ a boy once; his name was Israel Adams.

Q. 24. Why was he employed ?

A. He was employed at the time we run an engine from Bordentown to Trenton; the distance being but six miles; the boy was employed to take the place of a man; it was not supposed to be worth while to put a man on such a short route. 711

Q. 25. Was he entered in the time-book at the time as a boy ?

A. He was.

Q. 26. Was William Quigley in his minority in the years 1843, 1844, and 1845 ?

(Objected to.)

A. As near as I can ascertain, he was born in 1827; that wouldmake him about of age.

Q. 27. How old would he have been in 1843, if he was born in 1827 ?

A. About 16 years old that would make him.

Q. 28. Then he was in his minority in 1843, 1844, and 1845 ?

A. He was.

Cross-examined, subject to the general objections heretofore noted:

Cross 29. How do you know that he was born in 1827 ?

A. I only know by inquiring of his relations—an uncle of his; I made the inquiry this morning; it is his uncle by marriage; his name is Peter Bloomsburgh.

Cross 30. How do you know he is his uncle by marriage ?

A. I only know from common report, by what other people have told me.

Cross 31. What are the statements you have made here this morning based upon; your own personal knowledge of the facts, or are they made from what you have seen entered in the books ?

(Objected to, as he has stated that he entered the facts in the books himself.)

A. From both my own personal knowledge and the original record in my own handwriting.

712 Cross 32. Which ones of them are made from your own personal knowledge?

A. From my own personal knowledge William Quigley was not a fireman on the road at the time he stated he was. He was not a fireman on the road till 1849?

Cross 33. What others of the statements are on your own personal knowledge?

A. Of my own personal knowledge he was not employed on the road previous to 1849 in any capacity.

Cross 34. Question repeated.

A. I don't know that I can call to my mind any other in particular.

Cross 35. What do you mean when you say that he was not there to your personal knowledge? Do you mean that you did not see him?

A. Yes; if he had been about there I should have seen him; I don't think he could have been about there and I not have seen him—certainly not employed there at that time, or I should have seen him.

R. C. BURGBY.

Subscribed and sworn to before me this 25th September, 1868.

R. E. STILWELL,
Examiner, &c.

FRIDAY, *September* 11, 1868.

NICOLL F. SMITH, recalled on the part of the defendants, deposes and says:

Q. 1. Were you in the employ of the Camden and Amboy Railroad Company in 1859?

A. I was.

Q. 2. Had you a brother who was once in the employ of the said Camden and Amboy Railroad Company? If so, in what capacity was he employed in the year 1859?

A. I had; he was fireman in the car department, under Edwin Lockwood, who had charge of the department, and he, Smith, was so employed in the year 1859.

713 Q. 3. Do you know of your brother going to Canandaigua, New York, as a witness in a brake case tried there in the year 1859?

A. I do.

Q. 4. You will please state the circumstances, if any, connected with his going to attend such trial.

A. A gentleman by the name of Waterman came to Bordentown, to our shop, to see Edwin Lockwood, the boss of our shop. He, Lockwood, not being at home, but being away, he went to my brother, who was foreman of the shop, and wanted him to go. My brother came to me and asked my opinion about his going in the absence of M'r Lockwood. I referred him to M'r Van Rensselaer, superintendent of the road. He told me he would like to go more because M'r Waterman promised to get him passes to go to Niagara and back, and pay his expenses. He did go, and came back again, and visited Niagara and several other places, as he told me.

(Objected to.)

Q. 5. From whom did he get permission to leave the employ of the company for the purpose of attending this trial at Canandaigua?

A. R. S. Van Rensselaer, superintendent of the road.

Q. 6. You say that M'r Edwin Lockwood was absent from Bordentown when Waterman called to see him. About to what place?

A. He had gone to Tarrytown, New York, I think.

Q. 7. Did M'r Waterman leave Bordentown before M'r Lockwood returned to Bordentown?

A. He did; or, at least, I did not see anything of him after that day.

Q. 8. How long, as near as you can recollect, had M'r Waterman been gone when M'r Lockwood returned?

A. Some three or four days.

Q. 9. Do you know that M'r Lockwood was not at the shop of the company in Bordentown on the day on which M'r Waterman called to see him?

714 A. I know that he was not there, and had not been for a day or two.

Q. 10. Is your brother referred to in your deposition living? If not, when did he depart this life?

A. He died, I think, three years ago last April.

Cross-examined by M'r Cozzens:

Cross 11. How do you know that your brother went to Canandaigua?

A. He told me he did.

Cross 12. That is all you know about it, I suppose?

A. Yes, sir.

Cross 13. How do you know it was in 1859?

A. That is as near as I can get at it; I have nothing positive that I can go by. I think it was about eight or nine years ago.

Cross 14. How do you know that M'r Waterman came to Bordentown, to the shop, to see M'r Edwin Lockwood?

A. I saw him, and my brother told me his name was Waterman; I saw him talking with my brother. I didn't hear what he said; my brother told me he asked for Lockwood.

Cross 15. How do you know that he wanted your brother to go to Canandaigua?

A. My brother told me so; he came to ask me whether he had better go or not.

Cross 16. Is that all you know about what M'r Waterman wanted of your brother—what your brother told you?

A. That is all.

Cross 17. How do you know that your brother got permission to go to Canandaigua; and, if he did, how do you know that he got it of M'r Van Renssalaer?

A. He told me so, and showed me the passes that M'r Van Renssalaer gave him to go to New York and return. (The portion about passes objected to.) I know he got permission from M'r Van Renssalaer, because he told me he did.

Cross 18. Is that all you know about it?

A. Yes.

715 Cross 19. Do you know what your brother went to Canandaigua to give testimony about?

A. Concerning some brake or brakes.

Cross 20. Do you know what about them?

A. I don't know any particulars.

Cross 21. What is all the knowledge you have on the subject, whether particulars or not?

A. I don't know any particular part of the brakes or brake he went for, whether it was Tanner's, Hodges', or some other kind of brake.

Cross 22. You mean then, do you, that you don't know anything at all about what he went to testify to concerning either or all those brakes?

A. I don't know anything about it than what he told me—that it was about brakes.

Cross 23. What time of the year was it that M'r Waterman was at Bordentown?

A. It was towards fall pretty well; I can't say whether it was August or September, but somewhere about the first of the fall or latter part of the summer.

Cross 24. How do you know that Lockwood was absent at this time?

A. Because I was there, and I know when he goes away.

Cross 25. How do you know when he goes away?

A. I know whether he is in the shop or not, or around it.

Cross 26. Do you know every time when he goes away?

A. If he is gone any length of time.

Cross 27. On this occasion, in 1859, did you see him leave Bordentown?

A. I did not.

Cross 28. Then your knowledge of his being absent at that time is derived from your not remembering that you saw him about the shop then, is it?

A. Yes; he was not about the shop. I did not see him about the shop for several days; he was not about the shop for several days.

Cross 29. What makes you think Lockwood had gone to Tarrytown at that time?

A. He has been in the habit of going there for several years back every year.

716 Cross 30. Who did he go to Tarrytown to see in 1859?

A. He has relations living there; he was born and brought up there, I think.

Cross 31. Can you mention the names of any of these relations?

A. I cannot mention any of them.

Cross 32. How often did Lockwood go away from Bordentown in 1859, at about that time?

A. He probably used to go to New York once a week and to Philadelphia once a week.

Cross 33. What makes you think that he went to Tarrytown on this particular occasion rather than to New York or Philadelphia or some other place?

A. Because he was gone longer.

Cross 34. Is that all the reason you have?

A. Yes, and my talking with him at particular times about his being there; that was about the time he goes up there.

Cross 35. What month in the year did Lockwood usually go to Tarrytown at that time?

A. The first of the fall or the latter part of the summer.

Cross 36. How long do you think Lockwood had been away at this time when Waterman came to Bordentown?

A. Two or three days.

Cross 37. You say Waterman talked with your brother; did you hear what either of them said?

A. I did not.

(Counsel for complainant gives notice that, upon the hearing this case, he shall move to strike out all of the foregoing deposition respecting information given to the witness by his brother and respecting Lockwood's alleged absence; the cross-examination having shown the same to be hearsay, and inadmissible.)

Direct resumed by M'r Whipple:

Q. 38. As a general thing could M'r Lockwood have been absent from the shop at Bordentown for any length of time without you knowing it?

717 (Objected to.)

A. No, he could not.

Q. 39. May not M'r Lockwood have gone to Tarrytown in 1859 in the forepart of the summer instead of the latter part, as you have stated?

A. He might have gone, but I think it was in the latter.

Q. 40. May it not have been in the forepart of the summer, and not in the latter part, as you have stated, that Waterman came to Bordentown to see Lockwood?

A. It might have been; but I think it was in the latter.

Q. 41. You are not positive, then, whether it was the forepart of the summer or latter, are you?

A. I am positive that it was the latter part when he went to Tarrytown.

Q. 42. What makes you so certain that it was the latter part and not the forepart?

A. I have no particular thing to be positive about it, but it is my opinion.

Q. 43. Then he might have gone in the forepart of the summer?

(Objected to.)

A. Yes, he might have gone.

Q. 44. And that might have been the time, might it not, when Waterman came to Bordentown?

(Objected to.)

A. It might have been.

Cross resumed by M'r Cozzens:

Cross 45. Do you know that the name of the person who came to Bordentown was Waterman, except by what your brother told you?

A. None but that and the description I have had of him since.

718 Cross 46. It is your best recollection, is it not, that it was the latter part of the summer or the first part of the fall that the person was at Bordentown?

A. That is my opinion, although it may have been earlier.

N. F. SMITH.

Subscribed and sworn to before me this 11th September, 1868.

R. E. STILWELL,
Examiner, &c.

TUESDAY, *September 15th*, 1868.

Present, counsel and complainant as before.

ISAAC DRIPPS, called and sworn as a witness on the part of the defendants, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Isaac Dripps; age, 58 years; reside at Fort Wayne, Indiana, and am master-machinist of the Western Division of the Pittsburgh, Fort Wayne and Chicago Railway.

Q. 2. How long have you been so employed?

A. Nine years last February.

Q. 3. How were you employed for several years previous to going to Fort Wayne as master-machinist, as you have stated?

A. I was master-mechanic, or rather superintendent of the Trenton Locomotive Works, at Trenton, New Jersey.

Q. 4. Prior to being so employed, for whom, or by whom, and in what capacity were you employed, and from what time to what time?

A. I was in the employ of the Camden and Amboy Railroad; I was superintendent of machinery there; I went in the employment of the company in 1831, and remained with them till 1852 or 1853, I think 1853; I was superintendent of machinery during the whole of the time I was there.

719 Q. 5. In an exhibit filed in this case, marked "Complainants' Exhibit, Dripps' new proofs," purporting to be a letter written by you to W'm H. Hubbell, of Philadelphia, you say in reply, in regard to double-acting brakes, that "the first you knew of them was when used on the Camden and Amboy Railroad"; please state when you first knew of such use on said Camden and Amboy Railroad.

A. The first I knew of double brakes, that is, brakes that would apply to both trucks, was on a car that was rebuilt by the company's shop at Bordentown, called the "John Tyler car"; the year I can't tell you; I can only fix the date in this way: when President Tyler first crossed the road, after being inaugurated President, he rode in that car, and the car was called the Tyler car afterwards.

Q. 6. Was there a double-acting brake on that car at the time it conveyed the President over the road; and, if so, how did it operate?

(Objected to.)

A. There was a double-acting brake on the car at that time; the brake was applied to the wheels by a brake-shaft at the end of the car; of course, as they wound the shaft up, it applied the brake-blocks against the wheels of the trucks; it applied it against the four outside wheels of each truck, the trucks being six-wheeled.

Q. 7. Are you personally acquainted with W'm H. Hubbell, of Philadelphia, to whom you replied, as represented in the aforesaid exhibit? If so, please state the extent and intimacy of such acquaintance, and whether you have had any personal interviews with him since the date of the aforesaid exhibit, to wit, the 31st January, 1860; if you have had such personal interview, please state when and where, and the subject-matter of such interview.

A. I am acquainted with M'r Hubbell, of Philadelphia; the first I became acquainted with M'r Hubbell was many years ago, when he was a young man; he came to Bordentown to the company's shop with a model or drawing of a spark-arrester for a locomotive which he was very anxious for the company to try; by direction of the superintendent, M'r E. R. Stevens, we had a pipe and spark-arrester 720 made according to M'r Hubbell's plan; we put it on a locomotive-engine and ran it and tried it; the result was, it proved a failure; I kept up the acquaintance with him, and saw him occasionally; he resided at Philadelphia and I in Bordentown; we would occasionally meet in the streets in the city of Philadelphia; the last time I recollect having any business with M'r Hubbell was on an eight-wheel-car case, with Ross Winans, which was tried in Canandaigua, New York; M'r Hubbell, I believe, was engaged as counsel, or had something to do with the case; he was there; I was a witness for the Erie Railroad Company; since that time I have no recollection of any personal interview with M'r Hubbell; I have never had any other than a business acquaintance with M'r Hubbell, nor any business with him farther than I have mentioned; I would like to modify that answer a little; I have no recollection of having any other business acquaintance with him than those I have already stated.

Q. 8. W'm W. Hubbell has testified in this case, in answer to the 21st question, complainants' new printed proofs, page 282, which question read as follows: "After receiving this reply from Dripps, what, if anything, did you do in relation to it?" The witness replies as follows: "I went to see what information I could get. I went to Bordentown, to the shops which were below Bordentown, to see the foreman of the car-shop, M'r Lockwood. I had been there before, and asked him about the double-acting brakes. He could not tell me the time when they were first used; but from the description of the brake having horizontal levers swinging free from the body of the car, I found it was the Hodge brake that was first used, and afterwards the nearest information I could get of the date from M'r Lockwood was about 1851. I was not satisfied about it until I had seen M'r Dripps, and I afterwards saw him in Philadelphia, and learned all the facts about the use of the double brake on the Camden and Amboy Railroad. M'r Dripps himself informed me that there was no double-acting brake used before 1851 and 1852. The information that I obtained was that the Hodge brake was the first double-acting brake used on the Camden and Amboy road, and 721 was used in 1851." And the said Hubbell further testifies, in answer to this question, that "there was no double-acting brake of any kind used before that time on the Camden and Amboy Railroad, and that they had seen the centre lever brake, as it is called, at Wilmington, on the Philadelphia, Wilmington and Baltimore road, which I represented, and they tried that on the Camden and Amboy road in 1852." Did you give the said Hubbell any such information as this answer sets forth? If you did not, please give such evidence in reference to the subject-matter of this answer as you may think proper.

A. I have no recollection of having had any such interview with M'r Hubbell, or giving him any such information whatever, as far as I am concerned. I never went to Wilmington to examine brakes, or any other railroad machinery. I would further say, that as long as I was on the Camden and Amboy Railroad, I never copied after machinery, or arrangements of machinery, of other roads; we generally planned out such arrangement of machinery as suited our purpose ourselves.

Q. 9. Assume that the aforesaid interview did take place between you and the said Hubbell in Philadelphia, as stated by him in the aforesaid answer, did you inform him that there was no double-acting brake used on the Camden and Amboy Railroad before 1851?

(Objected to.)

A. I did not, because I knew better; I knew that this Tyler car had the double brakes on.

Q. 10. Has there any person of late, say within a year, been to see you at Fort Wayne, to ascertain from you what you knew of double-acting brakes on the Camden and Amboy Railroad? If so, please state who the person was, and the subject-matter of conversation between you.

A. There was a gentleman called at my office at Fort Wayne. He commenced talk about railroad matters in general, and finally broached the subject of my former experiments on the Camden and Amboy Railroad, and then asked me what I knew about double brakes for rail- 722 road cars. I told him then (as I wrote to M'r Hubbell) that it had been such a long time since I had been on that road that I could only recollect the general arrangement or plan of the car-brakes; that my recollection of it was, that the arrangement applied to the wheels of both trucks, and that the brakes were applied by brake-shafts at the end of the car; but how the details were arranged I could not recollect; but if he would go to Bordentown, and apply to M'r Lockwood, the master car-builder of the Camden and Amboy Railroad, that he could give him all the information and details about the whole affair. After we got through our conversation, I finally asked his name, and he told me it was Waterman. I think he said Henry Waterman, but am not sure about that.

Q. 11. While you were in the employ of the Camden and Amboy Railroad Company, did that company have an important and somewhat expensive litigation to protect itself against a patent claim made on said company for the use of a certain mechanism invented and put into use by some one connected with said company before the date of the patent or claim on which they were sued? And, if so, please state the case, the result, and probable expense of the litigation.

(Objected to.)

A. The Camden and Amboy Railroad Company were sued for a smoke-pipe and spark-arrester which I invented and got up in the year 1833, and which has been in use on that road from that day to this. Some three or four years after we got it into successful operation, some parties had it patented, and it was a good while afterwards before the company was sued by the patentee for a violation of the patent. It came to trial in Philadelphia. It was a long, protracted trial, and finally the jury gave in a verdict against the company and in favor of the patentee. When the verdict was rendered, the judge granted the company a new trial, which took place in Philadelphia, and was still more protracted than the first trial, and resulted in favor of the company. I have no means of knowing the expense of the trial.
723 I can only judge or give an opinion. The first trial lasted a week, and the second trial still longer, maybe two weeks, and must have cost the company from six to ten thousand dollars to defend the suit. In conversation with the president of the company, M'r Robert L. Stevens, he said it would have been much cheaper and better for the company to have compromised with the patentee than to have defended the suit.

Q. 12. How long did M'r Stevens continue president of said company?

(Objected to.)

A. Up to the time of his death, which, I think, was in 1856 or 1857. I am not sure of the exact time.

Cross-examined by M'r Cozzens, counsel for complainant:

Cross 13. What was the name of the firm or concern which carried on the Trenton Locomotive Works during the time you say you were engaged there?

A. The name was the Trenton Locomotive and Machine Manufacturing Company.

Cross 14. Who were the principal stockholders in this company at this time?

A. M'r Van Cleve, M'r McKean, myself, and Joseph Potts; and there were others. I don't know the names.

Cross 15. Are M'r Van Cleve and M'r McKean now living?

A. M'r Van Cleve is living. M'r McKean is not.

Cross 16. Where does M'r Van Cleve reside?

A. I think he lives at South Amboy, New Jersey. He did live there the last time I heard of him.

Cross 17. What is his first name; and how long was he connected with the Trenton Locomotive Works?

A. A. H. Van Cleve. He was connected with it from the commencement of the works, which was in 1853, until after I left there, which was in 1858.

724 Cross 18. While you were on the Camden and Amboy Railroad as superintendent of machinery, what were your duties?

A. I had the general charge of the machinery of the road, and also the repairs of the steamboats from the Delaware end of the route.

Cross 19. Did you have anything to do with the building or repairing of the passenger-cars?

A. Only so far as getting up the iron work for the cars that were built or repaired at the shops.

Cross 20. Did this iron work include the brake-rigging?

A. It included all the iron work about the cars, wheels and axles; it did include the brake-rigging.

Cross 21. Were you in the habit of making any entries in any books relative to the nature of the iron work done on the cars?

A. I think not.

Cross 22. Do you remember the use on the Camden and Amboy cars of a double-brake styled the Hodge brake, having two cross levers under the car-body, hung so as to swing somewhat backwards and forwards?

A. I do not.

Cross 23. Did you ever know that a considerable number of such brakes were used for a considerable time on said cars?

(Objected to.)

A. I have no recollection of it; I would say that I know that there were brakes on the cars of the road while I was there, where the brakes were applied to the wheels of both trucks, but how the arrangement of rods and levers were fixed, I don't know; I can't recollect.

Cross 24. Do you know what is the construction and operation of the double acting brake which is known as the Hodge brake?

A. Yes; I am acquainted with the Hodge brake; we are using it on our road; it has a swinging lever in the centre, some of them has two, with rods connecting to the lever on the truck-frame, and then 725 rods leading from those levers to the winding shafts on the platforms of the car; the rods that run to the winding-shaft and to the brake-levers run from the ends of the swing-levers; I would also say, in addition, that lately I have paid very little attention to the brakes on the cars on the road on which I am engaged, as the whole of that business is attended to by the master car-builder of the road, and I don't claim to have a perfect knowledge of the detailed arrangements of the different brakes now in use.

Cross 25. Do you mean your descriptions of the rods connecting the swinging-levers with the winding-shaft and the brake-levers to apply to those brakes which you say has one swinging-lever, or to those which have two?

A. I can only answer that in this way, that I am not acquainted with the different modes of applying the brakes, as it is only recently that the Hodge brake has been used on the cars of the Pittsburgh, Fort Wayne and Chicago Railway.

Cross 26. When and where did you first see a brake of the form known as the Hodge brake?

A. The first I knew about the Hodge brake was probably some time during this year; I received orders from our general superintendent, M'r J. N. McCullough, to change the brakes on the cars of the company from the Stevens brake to the Hodge brake; when I received that order I really did not know what the Hodge brake was; I sent the master car-builder to examine the cars that had the Hodge brake on, and to change the brakes on our cars according to the order of M'r McCullough; as he found the Hodge brake he went to see under the cars, so that I paid but little attention to the details, and I left it with him; therefore I cannot explain further than I have done.

Cross 27. You then mean, do you, that you have explained the Hodge brake as fully as you are able to?

A. Yes.

Cross 28. Did you ever know of brakes of the form called the Stevens brake being used on the cars of the Camden and Amboy Railroad?

726 A. No; I did not; I will further say that it is so long since I was on that road, that I cannot recollect the detailed arrangement of any brake on that road; I can only recollect the general arrangement of the brakes being applied to the wheels of both trucks.

Cross 29. Can you describe the construction and operation of the Stevens brake?

A. I can describe it, but very imperfectly, from the fact that the master car-builder of the road attends to all such matters, and I pay no attention to it, unless that there might be orders for a change; then I merely issue the order to the master car-builder to execute the work; the Stevens brake, my recollection of it is, that each truck has two vertical levers, and the levers of each truck are connected together by rods; then another rod from one of the vertical levers of each truck run to the winding-shafts on the platform of the car.

Cross 30. Is that as fully as you can describe it?

A. That is my recollection of it; I can't go beyond that.

Cross 31. Can you describe the construction and operation of what is known as the centre lever or Tanner brake?

A. No; I cannot; I don't know as I ever saw a Tanner brake.

Cross 32. In about what year did the Camden and Amboy and New Jersey Railroad Companies first convey passengers between New York and Philadelphia, without changing cars at New Brunswick?

A. I do not know; I can't imagine the date.

Cross 33. Is your memory good about dates?

A. Well, I suppose about the same as the ordinary run of men; I don't know.

Cross 34. While you were employed on the Camden and Amboy road, did Camden and Amboy cars run through to Jersey City?

A. They did before I left the road.

Cross 35. For how long a time before you left the road?

A. I cannot possibly tell without some data.

Cross 36. About how many of them run through to Jersey City per day on an average?

727 A. Well, they were running two trains I think a day at those times; the Jersey City Company run one train of their cars, and the Camden and Amboy Company run one train; of course, then, the cars of each company made one round trip a day; the number of cars varied according to the number of passengers; they run at times from eight to ten cars; there were Camden and Amboy cars; as superintendent of machinery I had nothing to do with the running of trains; that part belonged to the superintendent of the road; therefore it was not

possible for me to know the exact number of cars run in trains, nor the number of trains running per day.

Cross 37. Did you ever examine the brakes of the Tyler car; if so, state when and where?

A. I cannot state any particular time that I examined the brakes on the Tyler car; but as the car was in the shop, being rebuilt, I, of course, saw all the work put on it as the work progressed.

Cross 38. You say, of course saw; do you remember that you did see it?

A. I cannot specify any particular time that I saw it, except as I have stated, as the car was being rebuilt; I suppose I saw the car in the shop every working day.

Cross 39. Do you now distinctly remember that you saw the brakes of the Tyler car at the time it was being rebuilt, as you say?

A. I distinctly remember when the car was finished, the general plan of the brake, that the brake blocks were applied to the wheels of both trucks, but I cannot recollect the arrangement of the details of levers, and rods, and blocks.

Cross 40. Question repeated?

A. I do; at the time the car was finished.

Cross 41. Do you mean by your 39th answer that you cannot recollect or describe any more of the brakes on the Tyler car than that the brake-blocks were applied to the wheels of both trucks?

A. Nothing more than that, except that the brakes were put on from the platform of the car.

Cross 42. The brakes of all hand-brakes are put on from the platform or body of the car, are they not?

728 A. Yes.

Cross 43. Then this is equally true of what is called the single brake, is it not?

A. Yes.

Cross 44. Are you aware that a good many years ago a great many of the Camden and Amboy passenger-cars had upon them two single-acting brakes, one at each end of the car, and also that some of them had a single-acting brake on only one end of the car?

A. I recollect that all the passenger-cars before the John Tyler car had single brakes, one on one truck of the car only; but I have no recollection of brakes being on each end of the car-truck of the car acting separately, one independent of the other.

Cross 45. Did you never, at any time, see any Camden and Amboy cars with two such single-acting brakes?

A. I have no recollection of ever seeing anything of the kind, neither do I think there ever was such during the time I was on the road; in case the connecting rod between the brakes of the two trucks should break, it would make them single-acting brakes for the time being, until the rods were replaced.

Cross 46. Do you remember seeing on any Camden and Amboy cars any such brakes as those spoken of when the connecting rods were broken?

A. I have no recollection of any on the Camden and Amboy cars.

Cross 47. In a car which had two single-acting brakes, one at each end, the brake-blocks can be applied to the wheels of both trucks, and can be put on from the platforms of the car, can they not?

A. Yes, they can; one from each platform, if arranged for that purpose; I mean if arranged with the winding-shafts on the platforms.

Cross 48. Now, if, as you have said, you are not able to describe any

more of the brake which you say was on the Tyler car than that "the brake-blocks" were applied to the wheels of both trucks, and were "put on from the platform," and if a car with two single-acting brakes, as has just been mentioned, would do the same, do you feel that
729 you are prepared to swear positively after this lapse of time that the Tyler car had brakes different from two single-acting brakes?

A. In answer to that, I can say the brakes were applied to the wheels of both trucks at the same time; but what the mechanism was that was used for that purpose I cannot now recollect.

Cross 49. If it was proved to you beyond doubt that, at and after the time when you say the Tyler car was rebuilt, the Camden and Amboy Company was using on many of its passenger-cars two single-acting brakes, acting independently, one at each end of the car, would you not think it possible that you might have confounded in your memory such a mode of putting brakes upon cars with the mode you thought you remembered on the Tyler car?

A. I answer distinctly, no; and I will give my reasons for so answering. The John Tyler car, when it was first rebuilt, was a very prominent car to us railroad people; we had put on it all the improvements that we had made up to that time; one of the most prominent improvements was this double-acting brake; another improvement was a new journal-box we had just invented, which was a perfectly oil-tight box, and which box is still used on the Camden and Amboy cars to this present day, and is one of the best boxes now in use. All these improvements being put on the car made it very prominent, and is the reason I assign for my remembrance of that particular car. The performance of the brakes on that car was very effective, and was much talked about by those running the trains as being the best brakes then on the road.

Cross 50. Then, do you mean that your way of remembering that the Tyler car had a double brake was because it had a great many improvements on it, and was a prominent car?

A. That in connection with the fact that President Tyler crossed the road in that car, and it was called the Tyler car ever after.

Cross 51. For how many years have you remembered that the Tyler car had a double brake?

730 A. From the time the car was first finished. When Tyler first crossed the road after his inauguration as President of the United States.

Adjourned to 10 a. m. the 16th inst.

WEDNESDAY, *September 16th*, 1868.

Present, counsel and complainant, as before.

At the opening of the examination witness states that he desires to make a correction of his answer, given yesterday, respecting the use of single-acting brakes acting independently of each other upon each truck of Camden and Amboy passenger-cars, and says that he has been thinking the matter over since the testimony given yesterday, and that he now distinctly recollects that the trucks under the tenders of locomotive engines had brakes to each truck, acting separately from each other. The brake on the front trucks of the tenders was under the control of the engineer. The brakes on the hind truck were under the control of the brakeman of the train. He sat on the top of the tender, and I have no doubt but such an arrangement of brakes were in use on the trucks under the passenger-coaches.

Cross 52. You say you have been thinking this matter over since yesterday. Has M'r Whipple or any one else had any conversation with you since your examination yesterday on the subject of these single-acting brakes on the passenger-cars?

A. No; there has not. This morning M'r Whipple called for me at the hotel, and we walked together here. I then told him I had been thinking over the matter since I was here, and I told him that I recollected distinctly of the arrangement of the brakes under the tenders on that road, and asked him if I couldn't have my answer of yesterday altered; and I also told him the reason why I could recollect the 731 brakes on the tenders more distinctly than on the cars was owing to the fact that I had all to do with the locomotives and tenders, and had but very little to do with the passenger-coaches, as the supertendent, M'r E. A. Stevens, kept that matter entirely in his own hands.

Cross 53. Did M'r Whipple say nothing to you at all on the subject until you spoke to him, as you have stated?

A. I think I mentioned the subject to him first.

Cross 54. What did he say when you did speak to him about it?

A. He said I could have my answer amended when we first commenced, or it might be brought in on questions afterwards. That was his reply.

Cross 55. Did he not talk with you about the brakes on the tenders, or on the passenger-cars?

A. No; I did the talking myself, as stated in my former answer.

Cross 56. Are you positive that he did not say a word to you on the subject?

A. Nothing further than I have stated.

Cross 57. You felt very sure, did you not, yesterday, that there were no passenger-cars of the Camden and Amboy road which had two single-acting brakes, acting independently, on each truck?

A. My recollection of my answer given yesterday is, that I had no recollection of any such arrangement of brakes, nor did I believe there was any.

Cross 58. Question repeated.

A. No surer than that answer implies. The questions put to me afterwards during the examination in the afternoon called my mind more particularly to the subject, when I distinctly recollected the arrangement of the brakes under the tenders.

Cross 59. Does not the expression in your answer yesterday, when you were asked if you had never, at any time, seen any Camden and Amboy cars with two such single brakes, viz, "Neither do I think there ever was any such during the time I was on the road," mean that you felt quite sure about it?

A. I meant to say that the impression on my mind then was 732 that there was no such arrangement of brakes on the cars on the road; but, as I have stated before, my mind being called to the subject more particularly from the questions asked me yesterday, in the examination in the afternoon, brought to my mind very clearly the arrangement of the brakes under the tenders.

Cross 60. That impression, when you gave that answer yesterday, was pretty strong, was it not?

A. I can only say that it was as strong as that answer implies.

Cross 61. What were the questions afterwards, on the examination of yesterday, which called your attention to the subject and made you think of the correction?

A. There was no particular question; it was the examination as a whole that called my attention more particularly to the subject.

Cross 62. You spoke of "questions afterwards;" there were but three questions afterwards; what was it in them which led you to have your attention called to the subject?

A. I can only answer that as I did the former question.

Cross 63. How sure do you feel this morning that there were such independent single brakes on the Camden and Amboy passenger cars, while you were on that road?

A. I have no doubt that there were cars with such brakes on them as called for in the question, while I was on that road.

Cross 64. Were not such brakes as these called by the railroad hands double brakes?

A. I have no recollection now of what the hands called them.

Cross 65. You said yesterday that you have remembered that the Tyler car had a double brake from the hour the car was first finished, when Tyler first crossed the road; could you at any time, since that time up to the present time, have told any one who had asked you about it that it had a double brake acting at the same time upon both trucks?

A. Recently—within this last ten years since—I have been out West. I would not like to have given a positive answer to that question 733 without due time for deliberation in thinking over the matter, as the occurrence referred to happened so long ago.

Cross 66. Did you not swear yesterday, in answer to the 9th direct question, in reference to seeing M'r Hubbell, the time referred to in such question being within ten years, and since you have been at the West, that you did not inform him that there was no double-acting brake on the Camden and Amboy Railroad before 1851, because you knew better—you knew that this Tyler car had the double brakes on?

A. In my answer of yesterday, about the interview referred to between M'r Hubbell and myself in Philadelphia, I said I had no recollection of any such interview, nor did I think it was possible that I could have told him that there was no double brakes in use on the Camden and Amboy Railroad up to the time that I left there, as I knew of this double-acting brake on the Tyler car.

Cross 67. Then do you mean that you could have told any one that you "knew of this double-acting brake on the Tyler car?"

A. I can only answer that I could after due thought.

Cross 68. How then can you state so positively that you couldn't have said so to M'r Hubbell, "because you knew that the Tyler car had double brakes on," if you could only state that it had double brakes on "after due thought?"

A. Because my attention has been called to this matter by M'r Blodgett, of Chicago; some time ago he sent for me, and told me that he would have to call on me as a witness in this case, and asked me several questions about it; what I knew about the case, which, of course, I told him all I knew about it; here recently he informed me that he wanted me to come to New York to give evidence in this case; I refused to come without the orders of the general superintendent, who telegraphed me to come, and I came on his order; now, then, since M'r Blodgett informed me that I would probably be called on as a witness in the case, I have given the matter considerable attention.

Cross 69. M'r Blodgett is one of the attorneys in this case, is he not?

A. I don't know.

734 Cross 70. Did he tell you he wanted your testimony in a case he had, or was engaged in?

A. My recollection of what he told me is this: That there was a suit against the Chicago and Northwestern Railway Company about a patent brake, and that they were about going to take testimony by commission in New York for that purpose, and he would want me to come on here and give my testimony; this is as near as I can recollect of the conversation that took place.

Cross 71. Did he show you a printed book of other witnesses about the case?

A. Yes; he showed me a printed book of testimony that had been taken in the case.

Cross 72. After your interview with him, and after, as you say, you had thought the matter over, did you come to the conclusion that the Tyler car had double brakes on when she was finished, "when Tyler first crossed the road?"

A. My recollection of the Tyler car always has been, as I stated above, that it had the double brakes on; but in thinking over the matter and trying to bring the occurrence more clearly to mind, it made the impression on my mind still stronger that such was the case, and the more I think of it the more I am convinced that I am right.

Cross. 73. Then you now mean, do you, that you could at any time have told that the Tyler car had double brakes?

A. Yes; but I would not want to go into any explanation without due thought and deliberation.

Cross. 74. What I want to know is this: Could you, at any time since the Tyler car was finished, as you have said, told this much about it, that when it was so finished, it had on double brakes; I don't ask whether you could have gone into any explanation about it beyond that; I merely ask whether you could have told that much about it?

A. I will answer, yes, I could.

Cross 75. You say a person came to see you within a year who gave his name as Henry Waterman; have you seen that person since?

735 A. I have not seen him, knowing him to be Henry Waterman.

Cross 76. Were you not some time ago more or less acquainted with Henry Waterman, of Hudson, New York, who was at one time master mechanic of the Hudson River Railroad?

A. Some time ago I had a slight acquaintance with a person named Waterman; I dont know whether it was Henry or not; I think he belonged to New York City at the time; I don't know what his occupation was.

Cross 77. Would you know that Henry Waterman again if you should see him?

A. I do not think I would.

Cross 78. You say you have not since seen the person who called on you, knowing him to be Henry Waterman, without reference to the name; have you seen the person since?

A. I think not; I don't know as I have.

Cross 79. What was the conversation between you and this person who called upon you?

A. It is impossible for me to give the whole conversation, as I made no note of it; we were talking about railroad matters in general; one subject we talked about was steam packing for steam cylinders; then he broached the subject of car-brakes; talked about that considerable; about our former experiments on the Camden and Amboy Railroad, and the experiments of the steam packing which were originally tried and had in use there; that was about as near as I can recollect what we were talking about; a kind of general conversation, nothing particular that I was aware of.

Cross 80. Did he ask you what you knew about when double brakes were first used on the Camden and Amboy Railroad?

A. He did.

Cross 81. What did you reply to him?

A. I replied to him as I stated in my former answer, and in a general
way; because I did not care to talk to a perfect stranger about those
things that happened so long ago; but told him that there were
736 double brakes on the John Tyler car; that I only could tell him
of the general plan of the arrangement of the brakes, and referred him to M'r Lockwood, master car-builder of the Camden and Amboy Railroad, for particulars.

Cross 82. Did you tell him that these double brakes acted upon both trucks at the same time?

A. I think I did.

Cross 83. What did he say to you when you told him this?

A. I can't recollect what his reply was, if any, as the conversation was general.

Cross 84. You have stated that you told M'r Blodgett all you knew about this case; what did you tell him about the time when double brakes were first used on the Camden and Amboy road?

A. My information to him was merely in general terms. I don't recollect that he went into particulars, nor do I recollect that I mentioned any time.

Cross 85. Did M'r Sayles, now present, call upon you at any time with reference to the subject of double brakes?

A. I have no recollection of it.

Cross 86. Think the matter over and see if you cannot recollect that he called upon you at Fort Wayne, within a year, or a little more than a year.

A. I can't recollect anything of the kind now.

Cross 87. May it not have been M'r Sayles who called upon you, and not M'r Waterman?

A. He gave his name as Waterman.

Cross 88. Did he resemble M'r Sayles in appearance?

A. No; if it had been M'r Sayles I think I should have recognized him now.

Adjourned to the 17th inst., at 2 p. m.

737 THURSDAY, *September 17th*, 1868.

Present, counsel and complainant, as before.

Witness here states that he desires to amend his answer to the 10th direct question by striking out the following words in that answer, "As I wrote to M'r Hubbell."

Cross 89. Who called your attention to the matter which you have just corrected?

A. M'r Whipple here this morning; he showed me the letter in the printed book in this case, in this office.

Cross 90. Are you this morning able to recollect any better than you could yesterday whether M'r Sayles, now present, has called upon you within a year past, with reference to the subject of double brakes?

A. I have thought of that matter since yesterday, and can only say as I did yesterday, that my impression is the person gave his name as Waterman; still, of that I am not certain, as in our discourse the name of Waterman was mentioned, and I may have got the two names mixed together; and in connection with this, I do say, that I do not hold myself responsible for any talk or answers to questions put to me by strangers calling on me at my place of business or elsewhere, as I am at times very much annoyed and my time taken up by persons calling on me in an unofficial way, and I at times give them any sort of an answer to get clear of their annoyance, and I do not hold myself responsible only for evidence taken under oath before competent parties.

Cross 91. Then, do you now mean that it may have been M'r Sayles that called upon you?

A. It may, or may not have been; but I am still of the impression that had it been M'r Sayles I should have recognized him here.

Cross 92. When was it that the person called upon you?

A. I can't state the time now, as I made no memorandum of it.

738 Cross 93. May it not have been last fall, toward the cool weather?

A. It may have been; but my impression is that it was this spring; this year.

Cross 94. In the interview with that person, did you not say to him that you did not know, or could not tell, when the double brakes was first put on the Camden and Amboy cars, and that you did not think it was until after 1850?

A. I will say positively that I never told him any such thing; and that the year 1850 was not mentioned, to my recollection.

Cross 95. Did you not also tell him that you knew, or remembered the Tyler car, but that you could not tell what kind of a brake was on it, and that you did not know whether there was a double brake on it or not, and that you did not think there was any double brake on it before 1850?

A. In answer to the first part of that question, I would say, I may have told him, and I have no doubt but I did, that my recollection of the Tyler car was that it had the double brakes; brakes to each truck; but that I did not recollect, nor could I recollect the arrangement of levers connecting the brakes of the two trucks. I did not tell him that I did not think there was any double brake on it before 1850, nor have I any recollection of the year 1850 being mentioned in our conversation.

Cross 96. Is that the best answer you can make to this question?

A. It is.

Cross 97. Did you, several years ago, about the year 1858 or 1859, see M'r Henry Waterman, in Trenton, New Jersey, at a time when you were sick, and did he enquire of you respecting the use of double brakes on the Camden and Amboy Railroad, and did you thereupon refer him to M'r Edwin Lockwood for information?

A. I have no recollection of such a transaction whatever.

Cross 98. Did M'r Henry Waterman, or a person calling himself by
that name, ever call upon you in relation to the use of double
739 brakes on the Camden and Amboy Railroad, prior to the past
year, when, as you say, you think you saw M'r Waterman?

A. I have no recollection of him.

Cross 99. Did he not so call upon you at Trenton, at or about the time mentioned, and did he not enquire of you what had been the history of the use of double-acting brakes on the Camden and Amboy Railroad; and did you not tell him that you did not know or remember when double-acting brakes were first used on that road, and that you did not think they were used there prior to 1850 or 1851, and did you not thereupon refer him to M'r Lockwood for information on the subject?

A. I have no recollection of any such conversation whatever.

Cross 100. When did you leave Trenton to go into your employment at Fort Wayne?

A. In the early part of 1859; in January, I think.

Cross 101. Were you back again in Trenton for a short time, soon after first going to Fort Wayne?

A. I was. I think it was in April or May when I moved my family out.

Cross 102. May it have been in the latter part of May or the fore part of June?

A. I think not. I think it was about the first of May I moved out.

Cross 103. When you say this, do you mean that you are positive about it, or that it is now your impression?

A. No; that is my recollection of the matter. I am not positive.

Cross 104. Were you back again in Trenton a short time, soon after moving your family?

A. I think not. I don't think I was in Trenton again for probably a year afterwards.

Cross 105. Have you the original of the letter from M'r Hubbell to you, to which the exhibit marked "Complainants' Exhibit, Dripps' new proofs?"

A. No; I have not.

Cross 106. Do you know where it is?

A. I do not. I do not think it is in existence.

740 Cross 107. Who is the W. A. Dripps by whom that exhibit appears to have been transcribed?

A. He was my draftsman at the time the letter was written.

Cross 108. Did he write the letter by your direction and at your dictation?

A. I do not recollect; I presume that according to the usual course of business he wrote the letter at my dictation.

Direct resumed by M'r Whipple:

Q. 109. Is there anything in your deposition which you wish to modify or explain? If so, please do so.

A. I know of nothing now.

Cross 110. Do you know of any other matter or thing for the benefit of either the complainant or defendant in the trial of this case? If so, please state it.

A. I know of nothing.

ISAAC DRIPPS.

Subscribed and sworn to before me this 17th September, 1868.

R. E. STILWELL,
Examiner, &c.

Edwin Lockwood recalled on the part of the defendants:

(Same objection as to the last witness.)

Q. 1. Henry Waterman has testified in this case (see complainants' new proofs, page 136, and parts of folios 541 and 542) as follows: "I went to Bordentown and saw M'r Lockwood; I think it was some time in the latter part of 1859, a short time previous to the trial at Canandaigua; I told M'r Lockwood my business; that I was defending the railroad against the Hodge patent, and wanted to know his experience 741 with the Hodge and Tanner brakes; he gave me the history of their operations; he said they commenced with double brakes on their road, with the Hodge patent brake; that they purchased the patent; that they had introduced it generally on their passenger-cars."

Please make such response to this testimony as the subject-matter may seem to require.

(Objected to.)

A. I have to say that Henry Waterman never called on me to my knowledge; but I understood a man did call to see me, and I was not in Bordentown; but when I returned either from Tarrytown or Newburgh, I can't say which—I think I was at one of those places, but can't say which—my foreman (M'r Smith) informed me that there had been a person there to see me in reference to car-brakes; my not being present he (Smith) saw M'r Van Renssalaer, and he gave his consent for Smith to go to Canandaigua as a witness on a trial in reference to brakes; M'r Smith's excuse for going was that the party that came after him agreed to pay all his expenses, and take and show him Niagara Falls, of which he reported to me when he came back, he had been and seen the falls; I did not see the party that came after Smith to go to the trial.

Q. 2. In the year 1859, how many cars, including passenger and baggage-cars, did the Camden and Amboy Railroad Company have in their service?

A. I can't say; there was seventy-five cars, I should judge, and there may have been more.

Q. 3. Assume that the said Waterman did call on you, as he has stated, could you have said to him that the Hodge brake was generally used or introduced on the cars of that road at that time?

(Objected to.)

A. No, sir; I could not.

Q. 4. Why not?

742 A. Because I knew they were not generally used; there was two I know, and there may have been a half a dozen; I can't say.

Q. 5. Assume that said Waterman did call, as he has stated, and that he saw you, could you have informed him that you commenced with double brakes on that road with the Hodge patent; if not, why not?

(Objected to.)

A. I could not, for I know that we had the single lever brake on a car in 1843.

Q. 6. Was this single lever brake and the Hodge brake both of them double-acting brakes?

A. They were intended to be, I believe.

Q. 7. Henry Tanner has testified in this case (see complainants' new proofs, page 264, for 1051) as follows: "I went to Bordentown, to the Camden and Amboy shops; I saw a man there that was introduced to me as M'r Lockwood; I never had seen him before; I exhibited the model to him (of a centre lever brake) and told him that I wanted to get the brake on that road, and told him what M'r Baker was doing; we talked a good while about it, and he declined to put it on at the time, and the reason that he gave was, that they were putting on, or were going to put on, the Hodge brake." Will you please make such response to this testimony as the subject-matter seems to require?

(Objected to.)

A. I have no knowledge of any such transaction, either directly or indirectly; furthermore, I don't hold myself responsible for what I may say outside the court-room, for there is hardly a week passes that I am not annoyed by different parties for patents of different things pertaining to cars.

Q. 8. May not M'r Tanner have called on you, and the circumstance have escaped your recollection?

A. He might have called there; I have no knowledge of it.

743 Q. 9. When persons call upon you with enquiries about patents, and the introduction of patents, are you so situated as to be able to talk a good while about such matters?

A. I am not; my duties are very arduous; I have from 100 to 120 men employed to look after.

Q. 10. Do you know William W. Hubbell, of Philadelphia?

A. I have no acquaintance with him. I saw him a number of years ago.

Q. 11. He has testified in this case that he came to Bordentown some time in the year 1860, and that he obtained the information that the Hodge brake was the first double-acting brake used on the Camden and Amboy Railroad, and that it was used in 1832. Please state whether he obtained any such information from you.

(Objected to.)

A. He did not obtain any such information from me.

Q. 12. He has further testified in this case that they (meaning persons in the employ of the Camden and Amboy Company) had seen the centre lever brake, or Tanner brake, as it is called at Wilmington, and that they tried that on the Camden and Amboy road in 1852. Please make such response to that testimony as you may think proper.

(Objected to.)

A. I don't know what others might have seen, but I saw nothing. I never was at Wilmington till 1863, at the time the raid was made at Havre de Grasse, when the rebels burned up the bridge.

Q. 13. According to your best recollection, when did you first see Thomas Sayles, the complainant in this case?

A. My recollection is that I saw him four or six weeks before I was called here as a witness in this case.

Q. 14. At that time, did he show you a copy of a statement that had been made by you in relation to the use of brakes on your road?

744 A. He did not; he said he had seen a statement, but he did not show me a statement.

Q. 15. At that interview did you say to him that you was open to conviction, and that if he could show you that you were wrong in relation to the time and use of double brakes you would own it, but that you was sure you were right in the statements made by you in the paper above referred to?

A. I told him if he would show me where I was wrong I would acknowledge it; but I knew I was right in my statement.

Q. 16. Did you say to him at that meeting that it was possible that you might be mistaken as to the time the double brake was used on your road?

A. No, sir.

Q. 17. Did you say to him that you knew the first brake you ever saw that operated the brakes of all the wheels from either end of the car was the Hodge brake; did you say this to him then or at any other time?

A. I did not.

Q. 18. In a conversation with the complainant in this case, purporting to be in the year 1852, did you say to him that had you seen the Tanner brake before the company had made arrangements for the Hodge brake you would have recommended the company to use the Tanner brake?

A. I did not.

Q. 19. What was the argument used by M'r Hodge or his agent to induce you to make a trial of the Hodge brake?

A. He didn't make any to me whatever. It was first put on by order of M'r Van Renssalaer. M'r Van Renssalaer told me that the reason was that it adjusted itself to the wheels better than the single lever brake

(Objected to.)

Q. 20. What do you mean by the single lever brake?

A. The cross lever under the body of the car that the rods are attached to to couple the brakes of the trucks.

745 Q. 21. Was such brake then in use on the Camden and Amboy road?

A. It was.

Q. 22. Did you know Miles G. Morris, formerly of Springfield, Massachusetts?

A. I do not.

Q. 23. You have stated in your former examination in this case, in answer to the second direct interrogatory, "I have made a great many experiments in car brakes in various forms." I will now present you with a model marked "Lockwood's Exhibit," and ask if it is one of the forms which your experiments assumed, referred to as above?

(Objected to.)

A. It is.

Q. 24. Does the operating lever in this exhibit receive the whole force of the brakeman and distribute it to the two pairs of wheels?

(Objected to.)

A. It does, at eight points.

Q. 25. Do the levers connected to the operating lever draw towards the centre of the car?

A. They do.

Q. 26. Is the operating lever pivoted to a longitudinal timber under the body of the car?

A. It is.

Q. 27. Is the brake on this exhibit susceptible of being operated from either end of the car?

A. It is.

Q. 28. What is necessary to operate it from either end?

A. By another lever and connecting rod, the same as on this end.

Q. 29. Where would you connect the rod to the operating lever now on the exhibit?

746 A. At the lower end, the same as in the model.

Q. 30. To what extent was this exhibit used on the Camden and Amboy road, and when was it used?

(Objected to.)

A. It was applied to two baggage cars from 1841 to 1843; I can't exactly tell; previous to adopting the eight wheel baggage car.

Cross-examined by M'r Cozzens:

Cross 31. Was the thing represented in this exhibit an experiment?

A. No, sir; it was in actual use, and used for many years; it was put on as an experiment.

Cross 32. Was it put on just as is shown in this exhibit?

A. Yes, sir.

Cross 33. Were they four wheel cars or eight wheel cars it was pu down?

A. Four wheel cars.

Cross 34. As it was put on these cars, was there another lever and connecting rod so that it operated from either end?

A. No, sir.

Cross 35. Was one of the objects of this contrivance to enable brake shoes to be applied to each side of the wheels?

A. That was the main object, to clamp the wheels so as to check the train; that was the main car in the train to apply the brake; that car carrying the baggage was loaded very heavy.

Cross 36. Did it cause the wheels to slide?

A. It did slide the wheels.

Cross 37. Except for applying the brake shoes to both sides of the wheels, can you point out any advantage in this contrivance over the usual form of the single brake?

A. We got a multiplicity of leverage over an ordinary brake, because we have got a leverage three to one over an ordinary brake.

747 Cross 38. Does not this cause the wheels to slide even more readily than the usual form of single brakes?

A. It depends altogether upon the power applied to the operating lever.

Cross 39. Has it not the capacity to do this?

A. It has the capacity if you apply the power.

Cross 40. Was it designed when in use that the power should be so applied to it as to slide the wheels?

A. Yes. We slid the wheels, as it was thought at that time that a brake would not hold unless we slid the wheels, but experience has taught us since that it is bad policy to slide the wheels, as it spoils the wheels and rails both.

Cross 41. Do you mean to be understood in what you have said in regard to M'r Waterman, M'r Hubbell, and M'r Sayles that you do not recollect that they had the interviews with you that they have testified to?

A. I do.

Cross 42. You have stated that you saw M'r Hubbell a number of years ago. How came you to see him at that time?

A. I saw him at Bordentown with M'r Dripps. He was there in reference to a spark arrester to a locomotive. I can't tell how long ago it was.

EDWIN LOCKWOOD.

Subscribed before me this 25th September, 1868.

R. E. STILWELL,
Examiner, &c.

Adjourned to September 30th, at 11 a. m.

748 WEDNESDAY, *September 30th*, 1868.

Present, counsel for the respective parties.

Counsel for defendant offers in evidence certified copy of the minutes in the case of Henry Tanner vs. New York and Erie Railroad Company, marked "New York and Erie Exhibit."

(Objected to.)

At a stated term of the circuit court of the United States of America for the northern district of New York, in the second circuit, held at the city hall in Albany, on Tuesday, the twenty-fourth day of October, in the year of our Lord one thousand eight hundred and fifty-four.

Present, the honorable Nathan K. Hall, district judge.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD
Company.

Mess'rs C. M. Keller and S. Blatchford appear as plaintiff's counsel.
Mess'rs C. Daniels and T. P. Grosvenor appear as defendant's counsel.

Ordered, On motion of M'r S. Blatchford, of counsel for plaintiff, that a jury be empanelled, and that the trial of this cause do now proceed.

749 Whereupon the following named jurors were duly called and sworn, namely: John Artcher, David McCarty, Henry Swan, Peter Markle, Henry Rector, Alfred Southwick, Abram Buzzee, Garret Walley, William P. Davis, William Boardman, Patrick Cullen, John M. Blessing.

The four last-named jurors are talesmen here summoned and returned by marshal as per order of court now entered.

Plaintiff's counsel opens and reads documentary evidence.

Plaintiff's witnesses, Harvey Waters, James J. Mapes.

Court here took a recess to 3½ p. m.

3½ p. m. Court met. Present, Judge Hall.

SAME
vs.
SAME.

Trial continued.

Plaintiff's witness (Mapes examined) John Clark.

Plaintiff rests.

Damages stipulated at $75.

M'r Daniels here opened the defence.

Defendants read documentary evidence and depositions.

Defendant's witnesses, Henry Gray, Samuel E. Dennis, Joseph F. Talson, Moses Parrett, Bernard Hughes, Frederick Boyes, Nehemiah Hodge.

WEDNESDAY, *October 25th*—9 a. m.

Court met. Present, Judge Hall.

SAME
vs.
SAME.

Trial continued.

Defendant's witnesses (Dennis re-examined), Wilson Eddy, Sarah A. Nicholas, Ferdinand Le Pennes.

Defendant rests.

750 Plaintiff reads depositions.

Plaintiff's witnesses, Lafayette Thompson, Asahel G. Bachelder (Waters re-examined).

Court here took a recess to 3½ p. m.

3½ p. m. Court met. Present, Judge Hall.

Ordered, That jurors not empanelled be discharged to 9 to-morrow morning.

SAME
vs.
SAME.

Trial continued.
Plaintiff's witness (Mapes re-examined).
Depositions read.
Defendant's witness (Hodge re-examined).
Testimony here closed.
M'r Daniels then sums up for defendant.

THURSDAY, *October 26th*—9 o'clock a. m.

Court met. Present, Judge Hall.

SAME
vs.
SAME.

Trial continued.
M'r Keller summed up for plaintiff.
Judge Hall here charged the jury.
Bailiff was sworn and jury retired to consider verdict.
One more bailiff sworn.

SAME
vs.
SAME.

Ordered, Marshal furnish jury out in this case with refreshments.

751 The jury here come into court, and being called, answer and say that they find for the plaintiff a verdict for seventy-five dollars damages.

Ordered, On motion of defendant's counsel, that jury be polled, whereupon each juror answers "This is my verdict."

Ordered, On motion of M'r Farrington, defendant's counsel, that defendant have forty days within which to make a case or bill of exceptions, or both, and that in the mean time all proceedings on the verdict be stayed.

Ordered, That plaintiff have also forty days within which to serve amendments after service of a copy of said bill on case or both.

At a special chambers term of the circuit court of the United States in and for the northern district of New York, in the second circuit, held at the United States court rooms in the city of Buffalo, on Tuesday, the 7th day of August, A. D. 1865, pursuant to the following: "Ordered, That arguments and motions in all equity and admiralty cases, and also in law cases, which can, by the rules and practice of this court, be heard in variations. be put upon the clerk's calendar and heard (as stipulated by and between the counsel and advocates of the respective parties) at the United States court room in Buffalo, before the judges of said court, on the 7th day of August next, at 10 a. m., and succeed-

ing days, until pending cases are disposed of. Dated, July 18, 1855. S. Nelson." And which order was duly filed and entered in said clerk's office on the 19th day of July, 1855.

Present, the honorable Samuel Nelson and Nathan K. Hall, judges.

Ordered, Court was here opened by proclamation.

752 SAME
vs.
SAME.

Ordered, on motion of M'r S. Blatchford, of counsel for plaintiff (M'r Daniels, of counsel for defendant, consenting thereto), that the motion for a new trial in the bill of exceptions be denied.

On motion of M'r S. Blatchford, for plaintiff, M'r C. Daniels, for defendant, consenting, it was ordered that the verdict entered in this cause, October 26th, 1854, be amended by adding thereto the following words: "And that the Stevens brake and the Hodge brake, used by the defendant, are infringements of the plaintiff's patent.

A copy from book of minutes.

Witness my hand and official seal at my office in Utica, in said district, this 6th day of December, A. D. 1866.

[SEAL.] AUG'T A. BOYCE, *Clerk.*

[5 ct. internal revenue
stamp cancelled.]

Erie exhibit.

R. E. STILWELL, *Examiner, &c.*

752½ THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY
Company.

Exhibit No. 6. Supreme court record.

W'M H. BRADLEY, *Clerk.*

753 EXHIBIT "F."

Circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY
Company.
In equity.

Complainant's new proofs.

754 Circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY
Company.
In equity.

Testimony taken on the part of the complainant for final hearing by

Joseph Gutman, j'r, examiner, &c., under the 67th rule of the Supreme Court of the United States.

NEW YORK, *February* 18*th*, 1868.

Present, S. D. Cozzens, esquire, of counsel for complainant, and the complainant in person; and S. M. Whipple, esquire, of counsel for defendant.

JAMES E. HUTTON, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

Q. 1. What is your name, age, residence, and occupation?

A. My name is James E. Hutton; I am 46 years of age; I reside at No. 49 Mercer street, in Jersey City, in the State of New Jersey; I am an engineer by occupation.

755 Q. 2. What sort of an engine do you run as an engineer, and where are you at present employed?

A. I run a locomotive, and am at present employed by the New Jersey Railroad and Transportation Company.

Q. 3. How long have you been in the employ of that company? And if you have been in its employ at different times, please state when such times were, mentioning the first of them, and then the others of them in order.

A. I began there on the 1st day of May, 1839, and have been away at different times. I was there the first time from the 1st of May, 1839, till about the middle of August, 1844. I returned to their employ again, I think, in July, 1845, and remained there until January 8th, 1855. I left there January 8th, 1855, and returned to them January 7th, 1856. I remained with them then until May 11th, 1856, then left, and was away until August 11th, 1861. I returned to them August 11th, 1861, and have remained with them ever since.

Q. 4. Are you familiar with the construction and operation of what are called double-acting brakes for railroad cars?

A. Yes, sir.

Q. 5. Will you please state, as nearly as you are able to, in what year double-acting brakes for railroad-cars first commenced to be used on the New Jersey Railroad and Transportation Company's railroad?

A. In 1851.

Q. 6. State, if you know, by whom said double brakes were put upon the cars of said road at that time?

A. By M'r Baker—David H. Baker.

Q. 7. Prior to the time when M'r Baker so put these brakes on said road, was any double brake of any kind ever tried upon said railroad?

A. None that I know of; I never have heard of it.

Q. 8. What were your opportunities of knowing what kinds of brakes were used upon said railroad during the times you have been in its employ?

A. My being around and seeing. I could tell by the way they held the train, and by seeing whether they were using the single or
756 double brake. They had been using the single brake up to 1851.

Q. 9. Are you acquainted with Joseph F. Talson; and, if so, how long have you known him?

A. I am, and have known him since 1839—since I first went to work for the railroad company.

Q. 10. Did you ever know of his trying a double-acting brake on said railroad; and, if so, in what year was it, as near as you can recollect?

A. I heard of his trying one, but I don't know that I have ever seen it. This was between 1841 and 1843 or 1844.

Q. 11. You say you don't know that you ever saw Talson's brake. Could it have been in use any length of time between 1841 and 1843 or 1844, without your knowing it and seeing it?

A. I don't think it could.

Q. 12. Between 1841 and 1843 or 1844 what kind of work were you doing for the New Jersey Railroad Company?

A. I was acting part of the time in the shop and part of the time on the road as extra engineer.

Q. 13. How much of the time were you on the road as extra engineer between 1841 and 1843 or 1844, and what kind of trains were you running?

A. Sometimes I would not be on the road for more than one day in the week; sometimes I would be on for a whole week. It was principally passenger trains I was running; once in a long while, perhaps, a freight-train.

Q. 14. About how frequently during those years were you on the road as engineer for a week at a time?

A. I might have been once a month.

Q. 15. You say you might have been. To your best recollection, how frequently was it?

A. Once a month.

Q. 16. Between what points or places did these passenger-trains you have spoken of run, when you were running them as extra engineer?

757 A. Newark, Elizabeth, Rahway, and New Brunswick. They started from Jersey City and ran to those points.

Q. 17. Do you remember what year it was that Talson left the employment of the New Jersey Railroad Company?

A. In 1849.

Q. 18. At that time what kind of brakes were in use on the cars of the said railroad?

A. Single brakes

Q. 19. You have stated that prior to the time when M'r Baker put double brakes on said railroad no double brakes of any kind were ever tried there that you know of, or ever heard of. Are you able to state positively whether prior to 1851, when M'r Baker put on said brakes, there were or there were not any double brake or double brakes used on said railroad, with the exception of the brake you have spoken of as tried by Talson?

A. I think I can.

Q. 20. Will you then please state whether any double brakes, with the exception of the Talson trial referred to, were used at any time on said road while you were in its employment prior to 1851?

A. There was none.

Q. 21. How positive are you of this?

A. I am well satisfied there was none. I never saw one, so I am satisfied there was none there, for if there had been I should certainly have seen it.

Q. 22. Did you ever know of a car on the Camden and Amboy Railroad called the "John Tyler"?

A. I did.

Q. 23. When did you first know of that car, and for about how long did you continue to know of it?

A. From about the time it was built new until it was abandoned and thrown away. It was built new about the time Tyler took his tour through the country. I could not state at what time it was abandoned precisely. I think it was running at the time I left the road in January, 1855; I never heard of it after I came back.

758 Q. 24. During the time that you knew of this John Tyler car, what kind of a brake did it have? And if it had more than one kind of brake, please state how long, as nearly as you can, it had such different kinds of brakes.

A. When it first came out it had a single brake, and before it was abandoned it had a double brake. It had the single brake until 1851, and the double brake as long as I knew it afterwards.

Q. 25. What, if anything, makes you remember that after 1851 it had a double brake?

A. Having it in the train that I was running, and seeing the double brake on it.

Q. 26. What kind of double brake was on it?

A. What they call a double-lever brake.

Q. 27. Do you know the name that this double-lever brake goes by?

A. Hodge's brake.

Q. 28. What sort of a train was it which you ran which had this John Tyler car in it, and from where to where did such train run?

A. It was a passenger-train, and ran from Jersey City towards Philadelphia.

Q. 29. In what year or years did you run that train with the John Tyler car in it, and for how long a time did you run it?

A. From 1850 to 1855.

Q. 30. Did you have it in any train run by you at any time or times prior to 1850?

A. I think I did.

Q. 31. In what year and how long, as nearly as you can state, and please mention how frequently you had it in trains run by you prior to 1850?

A. I ran it in 1849; I can't tell how long exactly. I think I used to have it in the train run by me prior to 1850, as a regular thing.

Q. 32. How frequently did you have it in trains run by you after 1850?

A. I think the car ran right along with the train, as a regular thing, down to the time when I left in the first part of January, 1855.

759 Q. 33. Did you have it in any train run by you prior to 1849?

A. I don't know as I did, as I did not run a regular train until 1849.

Q. 34. Was there anything peculiar about this Tyler car which leads you to remember it particularly? If so, what?

A. There was; it had a privy on the platform. It was fitted up differently inside; had looking-glasses.

Q. 35. Did you notice the Tyler car often during the times that you were running it in trains, and did you also notice what kind of brake it had?

A. I did. I noticed it more particularly after it got a double brake on it.

Q. 36. You have said that "when it first came out it had a single brake." What time do you refer to when you say "when it first came out"?

A. About the time Tyler took his tour.

Q. 37. You have said that Baker put double brakes on the New Jersey

Railroad in 1851. Did the Tyler car have the Hodge brake on it before or after Baker put these brakes on said road?

A. I think it must be after, because I saw these of Baker's first.

JAMES E. HUTTON.

Subscribed and sworn to before me this 18th day of February, 1868.

JOSEPH GUTMAN, Jr.,
Examiner, &c.

Cross-examination of above witness waived by defendant's counsel.

Edgar Morris, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

760 Q. 1. What is your name, age, residence and occupation?

A. My name is Edgar Morris. I am fifty-eight years of age I reside in the town of Bergen, Hudson County, in the State of New Jersey. I am at present a real estate agent.

Q. 2. Were you ever in the employment of the New Jersey Railroad and Transportation Company; and, if so, how long were you employed by them?

A. I was. I was employed by them about twelve years, from 1837 to 1849. I went with them in the spring, and left in the spring.

Q. 3. In what capacity or capacities were you employed by them during these times?

A. I was employed to work in the car-shop to do general work—build and repair cars; we also had to go out on the road and attend to break-downs.

Q. 4. Are you familiar with the construction and operation of double-acting brakes for railroad cars?

A. Not from practical knowledge. I never saw any before I left the road.

Q. 5. Are you familiar with the construction and operation of single brakes for railroad cars?

A. Yes, sir.

Q. 6. During the time that you were employed on such railroad, from 1837 to 1849, what kind of brakes were used on the cars of said road?

A. There has been two or three kinds. At first we had what was called a cam-brake, with a treadle and rock-shaft; then we adopted the double brake on one truck, outside of the wheels, operated by a wheel.

Q. 7. Were both these kinds single brakes?

A. Yes, sir.

Q. 8. Are you acquainted with Joseph F. Talson; and, if so, how long have you known him?

A. I am. I have known him about 34 years.

Q. 9. Did you ever know or hear of a man by the name of Isaac Newton Stanley?

A. I have seen him and spoken to him.

761 Q. 10. Did you ever know of his trying an experiment on the New Jersey Railroad with a double-acting brake; and, if so, in what year was it?

A. I know of his trying the brake, but I am not positive of the year; I think it was in 1842.

Q. 11. How long did that Stanley experiment last?

A. I think about an hour and a half, when we shoved the car out and it broke and was taken off.

Q. 12. Was any double-acting brake used on that car or any other car on the New Jersey Railroad, down to the time you left the road in 1849?

A. I think not—that is, I never saw one. I never was away over a week or so at a time; it might have been put on when I was not there, and then taken off again.

Q. 13. Was any double brake used regularly on that or on any other car on said road, from the time of the Stanley experiment down to the time when you left the road, or was any double brake kept for use on that car or any other car during that period?

(Objected to.)

A. Not to my knowledge.

Q. 14. Could there have been without your knowing it?

A. I do not think there could.

Q. 15. What were your opportunities of knowing what kind of brakes were used on the cars of said road between the time of the Stanley experiment and the time when you left the road?

A. Most of my business was to attend to the brakes; to put on new brakes and repair old ones; to adjust them, and also to take out bad wheels and put under new ones. I could not do that well without handling the brakes and seeing them.

Q. 16. Did you ever know of a car belonging to the Camden and Amboy Railroad Company called the "John Tyler"?

A. It was generally called the Tyler car—that is the car you allude to.

Q. 16½. In about what year did you know of that car, and for
762 about how long a time did you continue to know of it; and during such time about how frequently did you see it?

A. I think it was somewhere near 1843 that car came on. I saw it about twice a week during the whole time it ran there, until the time when I left the road. I saw it from the time it first came on until I left the road.

Q. 17. During the time from 1843 till 1849 about how often, on an average, did you see it?

A. About twice a week.

Q. 18. In what kind of trains did it run during that period?

A. Generally in the Philadelphia train.

Q. 19. During all the time from 1843 till 1849 state, if you know, what kind of brake it had?

A. To the best of my knowledge it had a single-acting brake.

Q. 20. Could it have had a double-acting brake on it during this period without your knowing it?

A. It could not have been possible for it to have had it on for any length of time.

Q. 21. Why could it not have had it on for any length of time without your knowing it?

A. The first reason is that I should have seen it myself; the next is, I should have heard of it in the shop.

Q. 22. Was there anything peculiar in the construction or fitting up of that Tyler car? If so, what?

A. The main construction was similar to other cars, with the exception of its having a water-closet on the platform. It was fitted up a little different inside, more expensively, and the seats were differently constructed in the backs.

Q. 23. At about the time you first knew of the Tyler car in 1843, was there anything relating to the subject of car-seats that made you take any more particular notice of it than of other cars? If so, what was it?

A. Yes, sir; there was an effort to improve on car-seats. We used
then narrow-backed seats. The arm of the seat was hung from the floor,
and the garments would fall through the back of the seat. I had
763 an idea some time before this of making an improvement, and I
think about a year after that I accomplished it. The seats are
used now universally as improved by me. When we heard in the shop
that the Tyler car was in, I went down and examined it, and found they
had not got the improved seat in it.

Q. 24. About when was this that you so examined it?

A. I think it was the first day it came into Jersey City, in the year 1842 or 1843.

Q. 25. After that car came on the road was it a well-known car, and were the peculiarities of its fitting up and equipment well known on the New Jersey Railroad?

A. It had the reputation of the Tyler car, but I think the fitting up was altered. Its peculiarities were well known at the time.

Q. 26. You say you think the fitting up was altered; in what respect, and when?

A. I could not say when; the water-closet was taken off. It was not altered inside within a year. After my seats were in operation, seats on the same principle were put in; those are the respects in which it was altered.

Q. 27. You have said in one of your answers that you are not practically acquainted with double-acting brakes. Have you ever seen such brakes [illegible] any railroad cars, and are you familiar enough with them to know them when you see them?

A. I have seen them; I think I am familiar enough with them to know them when I do see them.

Q. 28. Have you ever seen the kind of double brakes which are now used most generally on the New Jersey Railroad on passenger trains?

A. Yes, sir.

Q. 29. You have said that part of your business was attending to the brakes. While the Tyler car was running on the Philadelphia trains you have referred to, did your business require you to do anything about said trains, at any time; and, if so, what did you have to do?

A. That I could not positively answer; but at that time I think
764 the men in our shop, myself and others, I think for two or three
years, did some repairs, when necessary, on the Philadelphia
cars.

Q. 30. What two or three years would this be?

A. From the time the Tyler car came in, and from the time they commenced to run the Camden and Amboy cars on the Philadelphia trains.

Q. 31. You speak of doing repairs when necessary on these Philadelphia cars. Did you also, when necessary, repair the Camden and Amboy Company's cars which ran in these Philadelphia trains coming into Jersey City?

A. I think we did. I consider them all to be Philadelphia cars.

And being cross-examined by M'r Whipple, of counsel for defendants, the witness deposes and says:

Cross-q. 1. Do you wish to be understood that you repaired, in the shops of the New Jersey Railroad and Transportation Company, cars belonging to the Camden and Amboy Railroad Company?

A. No, sir.

Cross-q. 2. What led you to observe the kind of brakes in use on the Tyler car?

A. The inspection of cars, looking under them frequently.

Cross-q. 3. Was it your business to inspect the Camden and Amboy cars that came to Jersey City while you were in the employ of said New Jersey Railroad and Transportation Company?

A. No, sir.

Cross-q. 4. If it was not your business, how can you say that there was or was not a double brake on the Tyler car of that road?

A. From being in the depot, repairing cars, and seeing them pass the shop, and from general intercourse with the cars all through the depot.

Cross-q. 5. What cars did you inspect, if not the cars of the Camden and Amboy Company?

A. I inspected none.

765 Cross-q. 6. Have you not stated that it was part of your business to inspect the cars?

A. I think not.

Cross-q. 7. You were asked in the second cross-interrogatory "What led you to observe the kind of brakes in use on the Tyler-car?" You answered, "The inspection of cars, looking under them frequently." Do you swear that you were or were not inspector of cars?

A. My answer was, that I did not say what kind of brakes were on that car. I was not inspector of cars.

Cross-q. 8. Will you now please tell us of your own knowledge what kind of a brake was on the Tyler car from the year 1843 until the time you left the employ of the New Jersey Railroad and Transportation Company, and describe its construction and operation?

A. I cannot.

Cross-q. 9. Then you don't know of your own knowledge what kind of brake was in use on that car?

A. No, sir; not positive.

Cross-q. 10. You say there was introduced into the Tyler car a seat on the principle of your seat. Please describe the seat which was introduced into said car.

A. It was a wide-back seat, hung at the top of the arm-rest; when it turned over it shut down very near on the cushion. It is like that now in common use.

Cross-q. 11. This car-seat, you say, was your invention, do you, and that the seat was put into the Tyler car? If so, at about what time?

A. I claim it as my invention. I think it was put into the Tyler car, for the reason that all the cars were running at the time I left with those seats in. I could not say at what time it was put into that car; it might have been 1846.

Cross-q. 12. Were you ever in the employment of the Camden and Amboy Railroad Company?

A. No, sir.

766 Cross-q. 13. Do you know what brakes were in use on the passenger-cars of that company from 1843 until the time you left the employ of the New Jersey Railroad and Transportation Company in 1849?

A. No, sir.

Cross-q. 14. Are you, or have you been, in the employ of the complainant in this case, Thomas Sayles, to look up evidence for him?

A. I have been requested to call on parties that he spoke of.

Cross-q. 15. What parties have you called on? Please name them in detail, and state what information was communicated to you in reference to the matter of brakes.

A. I called upon M'r Manahan, and he knew nothing about them. I called upon M'r Shafer, and he had no recollection about the double brake, except Stanley's, of which he only saw the gearing. I called on M'r Reed, at Newark—Erastus Reed. He had no recollection of any double brake while he worked for the New Jersey Railroad Company. I so understood him after about half an hour's conversation with him. He said he had put on what he called a double-acting brake on a four-wheel car of the Camden and Amboy Company. I called on Howell Roe, at New Brunswick. He knew nothing about them. I called on Joseph New, of New Brunswick. He knew nothing about them.

Cross q. 16. You say you are acquainted with Joseph F. Talson. Would he be as likely to know what brakes were used on the New Jersey Railroad and Transportation Company's cars as you would?

A. Yes, sir.

Cross-q. 17. What position did he occupy while on that road?

A. He was foreman of the car-shop.

Cross-q. 18. Did he or did he not apply a double brake to a platform-car of that road in the year 1842?

A. Not to my knowledge.

Cross-q. 19. Are you willing to state unqualifiedly that no such brake was applied to a car by said Talson?

A. No, sir.

767 Cross-q. 20. Was the Tyler car frequently in the trains which came to Jersey City, during the time you were in the employ of the New Jersey Railroad and Transportation Company, from 1843 to 1849, or not?

A. It was.

Cross-q. 21. Do you know of your own personal knowledge, and are you willing to stand by the affirmation, that there was no double-acting brake in use on the Tyler car from June, 1843, to the time you left the employ of the New Jersey Railroad and Transportation Company in 1849?

A. No, sir; not positively. I mean to be understood that I am not positive whether there was such a brake or not.

Cross-q. 22. You say you think you are familiar with double-acting brakes. Will you please describe the construction and operation of the one you are most familiar with?

A. All the knowledge that I have of them I have derived from looking at them under the cars. The one I have seen has a connection in the centre, a lever and rod, and chains at the end to wind up on the shaft.

Cross-q. 23. What other double brake are you familiar with?

A. I don't know that I am acquainted with any other double brake.

Cross-q. 24. Do you know the Hodge brake?

A. No more than that it is a double-acting brake; works similar to the one I have seen; I think, perhaps, that is the Hodge brake.

Cross-q. 25. What cars were they in use on, before you left, in 1849?

A. None that I ever saw.

Cross-q. 26. When and where did you ever see it in use?

A. In Jersey City, at the depot, two or three months ago, I think, and since.

Cross-q. 27. What caused you to examine it two or three months ago?

768 A. For my own satisfaction, as I had heard something about some lawsuit a year ago. I think somebody came to my house.

Cross-q. 28. Did Joseph F. Talson ever call upon you in reference to this brake matter? If so, did you or did you not tell him that you knew nothing about it?

A. He did; he asked me if I remembered anything about his putting a brake on the cars. I told him I did not. He said he was getting evidence in the case of Sayles against somebody else. I told him there had been somebody there about it before—about some brake case.

And being re-examined by M'r Cozzens, of counsel for complainant, he deposes and says:

1. Redirect q. You have said on your cross examination that you could not say positively whether there was a double brake on the Tyler car or not; will you state whether there could have been any kind of double brake on the Tyler car, for any length of time, from the year it came out until you left the road, without your knowing it?

A. I do not think there could; it is possible.

And being further cross-examined by M'r Whipple, defendant's counsel, he deposes and says:

1. Recross-q. How does it happen that you are so familiar with the Tyler car as to enable you at this late date to say there could not have been a double brake on said car without your knowing it?

A. I remember the car called the Tyler car, and I remember there were some things quite different about it than in others. I think if there had been a double brake on I should have known that. We had had the Stanley application there just previously, and there was considerable agitation about brakes.

769 2. Recross-q. Have you seen or heard the evidence that has been taken in this case by the defendant in relation to the brake on this Tyler car?

A. I have seen some of it, and heard some of it.

3. Recross-q. Were you informed by the complainant in this case of the particular point or points he wished to prove by you?

A. I don't think I have; he mentioned something about the time he wanted to prove. I am not certain about that; it was general conversation.

4. Recross-q. Have you or not determined your dates in relation to the Tyler car from the evidence already taken by the defendant in this case?

A. No, sir; I don't think I saw any of the evidence on that point. I take it from my own recollection and circumstances.

5. Recross-q. Please state the circumstances which enable you to fix the first time you saw the Tyler car?

A. It was on account of the election of Harrison and Tyler. I think the Tyler car came to Jersey City after Tyler had made his tour, and whether he was taken in that car and it was named after him, I can't say.

EDGAR MORRIS.

Subscribed and sworn to before me this 18th day of February, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

NEW YORK, *February* 19, 1868—11 a. m.

Present, M'r S. D. Cozzens, of counsel for complainant, and the complainant in person; and S. M. Whipple, esq., of counsel for defendant.

Examination adjourned to 1.30 p. m. of this same day.

JOSEPH GUTMAN, J'R,
Examiner, &c.

770 NEW YORK, *February* 19, 1868—1.30 p. m.

Examination further adjourned to February 20, 1868, at 11 a. m.

JOSEPH GUTMAN, J'R,
Examiner, *&c.*

NEW YORK, *February* 20, 1868—11 a. m.

Present, S. D. Cozzens, esquire, of counsel for complainant, and S. M. Whipple, esquire, of counsel for defendant, and the complainant in person.

GEORGE BROWN, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

Q. 1. What is your name, age, residence, and occupation?

A. My name is George Brown. I am 39 years of age. I reside at Harrison, in the State of New Jersey, and am a car-builder by occupation.

Q. 2. Where are you at present employed, and how long have you been employed there, and in what capacity?

A. I am at present employed by the New Jersey Railroad Company at Jersey City. I have been employed there since July 10, 1850. I have had charge of the men, under M'r David H. Baker, as assistant foreman, for about nine years of that time.

Q. 3. Are you assistant foreman to M'r Baker at the present time?

A. Yes, sir.

Q. 4. In what shop is it that you have charge of these men as assistant foreman?

A. In the car-department repair-shop.

Q. 5. Is M'r Baker the head foreman, or superintendent of that repair shop?

771 A. Yes, sir; he is master mechanic of that department.

Q. 6. Previous to the time that you became assistant foreman under M'r Baker, in what capacity were you employed on said New Jersey Railroad?

A. In repairing the cars that were running on the road whenever ordered.

Q. 7. Did these repairs before you became assistant foreman to M'r Baker, and also the repairs done in the car-shop since you have been such assistant foreman, include anything besides repairs to the car bodies; and, if so, what did they include?

A. They included the trucks and everything pertaining to them; the brakes and everything of that kind.

Q. 8. What kind of brakes for the passenger-cars are now in use upon said New Jersey Railroad?

A. They are a double-action brake; they are Sayles' brake, the single centre-lever brake.

Q. 9. State, if you know, when brakes like this were first put into use on said New Jersey Railroad.

A. It was in 1851, the first that I ever saw, or somewhere thereabouts.

Q. 10. By whom, if you know, were such brakes first applied to the cars of said railroad at this time?

A. By M'r D. H. Baker, to the best of my knowledge. I never saw any before.

Q. 11. Did you yourself have anything to do with the work on the first of these brakes, so applied by M'r Baker? If so, what?

A. I helped put up the first one that was put up in the shop there by M'r Baker.

Q. 12. Can you describe the general construction and connections of that first brake?

A. Yes, sir; I think I can.

Q. 13. Please do so.

A. There is a piece of timber bolted up against the body of the car;
then there is a cross-lever that comes crossways of the car, in the centre
of the car, which is attached by a bolt to the floor timbers; then
772 on each end of the centre lever there is about an inch hole; the
rod that runs to the lever that connects the two brake-bars hooks
on to this centre lever; that short rod connects to the centre lever from
one end of the truck and another rod connects to the brake-shaft on the
other end of the car, the opposite end from where that truck is.

Q. 14. You speak of one rod running to the lever that connects the two brake-bars of one truck; what, if anything, connects the centre lever with the lever uniting the two brake-bars of the other truck?

A. The other truck is constructed exactly the same way.

Q. 15. How about the other brake-shaft or windlass?

A. It is precisely the same.

Q. 16. That is the kind of brake, is it, which has since 1851 been in use on the passenger-cars of the New Jersey Railroad?

A. Yes, sir; the only kind I have seen in general use.

Q. 17. Before this kind of brake such as you have described was put on the cars of the New Jersey Railroad by M'r Baker, what kind of brake was in use on the cars of that railroad?

A. The single-action brake, using a crank on a brake-wheel, acting from one truck.

Q. 18. Prior to 1851, and between that time and July 10, 1850—the time when you went into the employ of the New Jersey Railroad—were there any double brakes of any kind in use on the cars of the said railroad?

A. I don't remember ever seeing a double-action brake before this one that M'r Baker put on; but soon after—I could not say how long, but a short time after—I saw the double centre-lever brake.

Q. 19. What cars did you see the double centre-lever brake on?

A. On some of the Camden and Amboy cars.

Q. 20. Do you know what patent name or patentee's name this double center-lever brake goes by?

A. I think it was the Tanner brake, or the Hodge; I don't remember which.

773 Q. 21. Can you describe the general construction and connections of this double centre-lever brake? If yea, please do so.

A. I don't know, really, that I could describe it here.

Q. 22. Was it like the single centre-lever brake you have above described, as applied by M'r Baker in 1851? And if it is different, please state what the difference is.

A. The difference is, one has the two centre levers; and the Sayles' brake—applied by M'r Baker in 1851—has but one centre lever.

Q. 23. Which one had the two centre levers?

A. The one that was on the Camden and Amboy cars.

Q. 24. You say you saw the double centre-lever brake on the Camden and Amboy cars soon after M'r Baker put on the single centre-lever brake; about how soon after was it, as nearly as you can state?

A. It might have been a month, it might have been more; I don't remember.

Q. 25. On about how many of said Camden and Amboy cars did you see such double centre-lever brakes at about that time?

A. To the best of my knowledge, I did not see more than one or two.

Q. 26. In what kind of trains—way trains or through trains—did these Camden and Amboy cars with that double centre-lever brake run?

A. In through trains to Philadelphia.

Q. 27. About how long a time was it after 1851, if at all, before you began to see any more than one or two of said Camden and Amboy cars with such two centre-lever brakes?

A. I could not say; I think they continued to put them on all the time from that time out, for a year or so.

Q. 28. After that year or so, what kind of double-acting brakes did the said Camden and Amboy cars have on?

A. As far as I know, they continued to use that brake until I saw, somewhere about that time, they had a brake that was applied by the engine reversing.

774 Q. 29. As nearly as you can state, in respect of years, how long was it after you first saw the double brake with two centre levers on said Camden and Amboy cars before you began to see that they had a brake that was applied by the engine reversing?

A. It was probably two years; somewhere along in 1853 or 1854. I remember distinctly that one was broken there, and we had to jack up the car; it worked against the two arms that run outside of the bumper.

Q. 30. Did you have anything to do with repairing the car at that time?

A. Yes, sir; I did.

Q. 31. Do you know the name that this brake that was applied by the engine went by?

A. I do not. I have heard that Stephens had a brake, and I think it was the Stephens brake, though I am not positive as to that. I don't know; I only know there was such a brake.

Q. 32. Did they, at and after the time you have mentioned, have this brake which was applied by the engine reversing on a good many of the Camden and Amboy cars, or only a few?

A. On a few.

Q. 33. Can you state about how long they continued to use brake applied by the engine on said Camden and Amboy cars?

A. To the best of my knowledge, they were using them till 1854 or 1855. They still used them at the time of the Burlington disaster.

Q. 34. After July 10, 1850, when you first went to work on the said New Jersey Railroad, did you, in the course of the repairs which you have said you attended to having done on the cars, repair the cars of the Camden and Amboy Company, when they needed it, at the Jersey City end of the route? and, if yea, please state for how long a time you did so.

A. We always did the necessary repairs that were necessary for the time being, so as to make them safe to run; but if there was anything wrong with the trucks and they needed to go to the shop, we would notify the master mechanic of the Camden and Amboy road at Bordentown. We have always done this up to 1866 or 1867.

775 Q. 35. Then where would these repairs necessary to the trucks be done?

A. They would send their men on, and they would do the repairs themselves.

Q. 36. Would they then do themselves all the repairs to the Camden and Amboy Company's cars except what might be called light repairs?

A. They, the Camden and Amboy Company, would, by their men.

Q. 37. What opportunities would these light repairs give you and the men working with you to ascertain whether the cars you repaired had double-acting brakes or single-acting brakes?

A. Whenever a train comes in there is a man who has the looking over of the train, who goes around the cars and under the cars and examines the wheels and sees if everything is right. Whenever there was anything wrong, the men would repair it and fix whatever there was to do. Whenever I was called out to do any repairs, I was compelled to go under the cars to do whatever there was to do, leather brakes and put them up.

Q. 38. Could you then, if these cars had double-acting brakes, fail to notice it?

A. No, sir; I could not.

Q. 39. If there had been any double-action brake in use for any length of time on the New Jersey Railroad at the time you first were employed there, in July, 1850, and down to the time when M'r Baker introduced the single centre-lever brake, could you have failed to know it?

A. No, sir; I think not. The single centre-lever brake was something entirely new to me. When the car was run out of the shop, M'r Baker went with it himself.

Q. 40. When do you mean it was entirely new to you?

A. At the time we first put it on there; when M'r Baker first put it on at the New Jersey repair shop.

Q. 41. Had you ever seen a double-action brake of any kind before this one that M'r Baker introduced in 1851?

A. No, sir; not to my knowledge.

776 Q. 42. While you were on the New Jersey Railroad, before the time that M'r Baker put this brake on, did you see any Camden and Amboy cars come into Jersey City; and, if so, what kind of brakes did they have?

A. I did see them come in. They had brakes on the same as our cars; single brakes, braking from one end of the car.

Q. 43. Did you see a good many of such Camden and Amboy cars; and what trains did they come into Jersey City on?

A. Not a great many; they did not at that time run a great many; they were on Philadelphia trains.

Q. 44. Were there any of them at that time which had double-action brakes?

A. No, sir; I never saw any. I never saw a double-action brake till I saw that one of M'r Baker's.

Q. 45. Could double-action brakes have been used to any extent on these Camden and Amboy cars which you saw come into Jersey City before 1851 without your knowing it?

A. I think not. I think I should have known it if they had.

Q. 46. Before you went into the employ of the New Jersey Railroad where were you employed?

A. At M'r William Cummings', car-builder, Jersey City.

Q. 47. How long were you in M'r Cummings' employ?

A. From the fall of 1844 till July 9, 1850.

Q. 48. In what capacity were you employed by M'r Cummings during this period?

A. Building cars. I served my time with him as apprentice, and did a little of everything.

Q. 49. From 1844 until July, 1850, what kind of brakes, whether double-acting or single-acting, were put by M'r Cummings on the cars built by him?

A. Single-acting brakes. I never saw any other until I saw M'r Baker put it on, to my knowledge.

Q. 50. Was M'r Cummings largely engaged in car-building from 1844 to 1850?

A. All he could do; he never was idle.

777 Q. 51. How far was M'r Cummings' shop from the station and shops of the New Jersey Railroad in Jersey City, from 1844 to 1850?

A. About, probably, 800 feet; the shops were quite close.

Q. 52. While you were in M'r Cummings' employment, did he build cars for the New Jersey Railroad Company; and, if so, to about what extent?

A. Yes, sir; he built about six cars—passenger cars.

Q. 53. While you were in his employment, did he build any cars for the Camden and Amboy Railroad Company; and, if so, about how many, as nearly as you can state?

A. No, sir; he did not, to my knowledge. He built four cars for the Belvidere road, and I do not know whether they were connected with the Camden and Amboy road.

Q. 54. What kind of brakes did these four cars have?

A. They were single-action brakes, to the best of my knowledge. I never saw any other kind until I saw the one M'r Baker put on.

Q. 55. In about what year were these four cars built?

A. As near as I can tell, in about 1847 or 1848.

Q. 56. In about what year were the last of these cars for the New Jersey Railroad built by M'r Cummings?

A. About the last of 1849, as near as I can remember. I worked on them and helped build them.

GEORGE BROWN.

Sworn and subscribed to before me this 20th day of February, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to February 21st, at 11 a. m.

JOSEPH GUTMAN, J'R,
Examiner, &c.

NEW YORK, *February* 21, 1868—11 a. m.

Present, S. D. Cozzens, esquire, of counsel for complainant, and the complainant in person.

778 Counsel for defendant not being present, and having sent a message that he was sick and could not attend before Monday.

The examination was further adjourned to February 24th, 1868, at 11 a. m.

JOSEPH GUTMAN, J'R,
Examiner, &c.

NEW YORK, *February 24th*, 1868—11 a. m.

Present, S. D. Cozzens, esq., of counsel for complainant, and the complainant in person, and S. M. Whipple, esq., of counsel for defendant.

Examination of the witness George Brown continued.

The witness desires to make the following explanation of a portion of his testimony given on 20th February:

In my answer to the 53d question I said that M'r Cummings had "built four cars for the Belvidere road." This was an error. The cars were built for the Burlington and Mount Holly road, and were two in number.

Q. 57. Did M'r Cummings build any cars for the Belvidere and Delaware road after you left his employment? If so, about how long after, and how many of them?

A. Some two or three years after he built three or four cars for that road.

Q. 58. Please state whether your duties, as you have described them, on the New Jersey Railroad, after you entered its employment, required you at any time or times to, yourself, go underneath the Camden and Amboy cars which you have referred to in your examination; and, if so, about how frequently did you have to do so?

A. I was so required. Sometimes I was at the depot looking over
the cars with M'r Ward—Ambrose Ward, the man who was with
779 me. I did this probably once or twice a week, whenever I was
sent there.

Q. 59. Did you, on these occasions, see the brake-rigging of said cars?

A. I did.

And being cross-examined by the counsel for defendant, the said witness deposes and says as follows:

Cross-q. 1. At this late day, are you prepared to state positively of your own knowledge what kind of brakes were on these cars, which you say you examined, belonging to the Camden and Amboy Railroad Company?

A. I am.

Cross-q. 2. Please describe the same.

A. They were the single upright-lever brake, braking on one truck.

Cross-q. 3. Do you know what kind of brakes were in use on the cars of the Camden and Amboy road from the year 1843 to the year 1850?

A. I do not.

Cross-q. 4. Do you know what kind of brakes were on the cars of the said Camden and Amboy road from the 10th day of July, 1850, when you entered the employ of the New Jersey Railroad, to the time when M'r Baker applied a brake to the cars of that road?

A. Of all the cars that I had anything to do with of the Camden and Amboy, I never saw but the single-acting brake on the Camden and Amboy cars during that time.

Cross-q. 5. Do you know what brakes were on the cars of said Camden and Amboy road which did not come under your observation?

A. I do not.

Cross-q. 6. Do you know that there were no double-action brakes in use on the Camden and Amboy road in 1850 and 1851, or do you infer
there were none because you did not see them?
780 A. I do not know. I did not see any, and never saw any, on
the Camden and Amboy cars up to about the time that M'r Baker
put this single centre-lever brake on, to my knowledge.

Cross-q. 7. Do you know of your own personal knowledge, and from the inspection of cars, that there was no double-action brake on any car of the New Jersey Railroad between July 10, 1850, and the time when the brake in question was applied by M'r Baker?

A. I never saw a double-action brake on any of the cars until I saw the one M'r Baker put on.

Cross-q. 8. Do you know there was not from personal inspection?

A. I was not general inspector of cars. I was employed to repair and overhaul cars for the New Jersey Railroad wherever I was sent by M'r Baker, and I never saw a double-action centre-lever brake on any cars belonging to the New Jersey Railroad at that time referred to.

Cross-q. 9. Do you know there was not from personal inspection of all the crate, passenger, and baggage cars of that road?

A. I do.

Cross-q. 10. What led you to personally inspect all the cars?

A. The crate-cars I was at work on almost every week during this time, repairing them, and I think if there had been a brake of this kind on I could not have missed seeing it. It was the same with the passenger and baggage cars. I never saw in my repairing, or assisting to repair them, anything other than the single-action brake, and many of them only had a brake on one end, that is speaking of the crate and baggage cars—freight-cars.

Cross-q. 11. Do you wish to be understood that you know nothing of the kind of brakes in use on the Camden and Amboy and New Jersey Railroads before you entered the employ of the last-named road in July, 1850?

A. I know of nothing that was there previous to that on the Camden and Amboy. I do know before I went there of what was in use 781 on the New Jersey road before I went there, because I helped on some of the trucks of that road before I went there.

Cross-q. 12. Do you know it any farther than that you saw it on those trucks; if so, to what extent?

A. I know that there was no double-action brake attached to the cars which we built for the New Jersey Railroad, built by M'r Cummings at that time.

And being re-examined by M'r Cozzens, counsel for complainant, he deposes and says:

1 Redirect q. What portion of the time you were in the employ of the New Jersey Railroad between July 10, 1850, and the time when M'r Baker applied the double-action brake, do you refer to in the last portion of your answer to the 10th cross-question?

A. I mean all the time up to the time M'r Baker put the double action brake on.

2 Redirect q. You were asked in the 12th cross question if you knew the matter there inquired about, "any farther than that you saw it on those trucks"; will you please answer that question a little more directly and as fully as you may be able to?

A. I knew it by what I saw and by what M'r Cummings built at that time.

GEORGE BROWN.

Subscribed and sworn to before me this 24th day of February, 1868

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to 2 p. m. same day.

JOSEPH GUTMAN, J'R,
Examiner, &c.

FEBRUARY 24, 1868—2 p. m.

782 Present, S. D. Cozzens, esquire, of counsel for complainant, and the complainant in person, and S. M. Whipple, esquire, of counsel for defendant.

DAVID H. BAKER, a witness called on the part of the complainant, having been duly cautioned and sworn, deposes and says as follows:

Q. 1. What is your name, age, residence, and occupation?

A. My name is David H. Baker; I am fifty-six years of age; I reside in Jersey City, in the State of New Jersey; I am a master car-builder, in the employ of the New Jersey Railroad.

Q. 2. Please state how long you have been in the employ of the said company as master car-builder.

A. Since September, 1849.

Q. 3. Please state who was your immediate predecessor on said road as master car-builder.

A. Joseph F. Talson.

Q. 4. What time did Talson leave the employ of said road?

A. In September, 1849, when I came.

Q. 5. Has Talson been in the employ of said company since that time?

A. Not to my knowledge.

Q. 6. What are your duties as master car-builder of said company?

A. To superintend the building and repairing of all the cars.

Q. 7. Have these been your duties ever since you went into the employ of said company in September, 1849?

A. They have.

Q. 8. Please state what kind of brakes were in use on the cars of the said New Jersey Railroad Company when you first went into their employment in September, 1849.

A. What were termed the single-acting brake, which acted on one truck independent of the other.

783 Q. 9. At that time, September, 1849, when you went into their employment, were there any cars or was there any car of said railroad company which had a double-acting brake, acting upon both trucks at the same time from one windlass?

A. I never saw any.

Q. 10. Could there have been any without your seeing them?

A. I do not think there could.

Q. 11. How positive do you feel of this?

A. I am as positive as I could be of anything; if it was on, the car could not have been on the road.

Q. 12. Could it have been on any car which was on the road without your seeing it?

A. Not at that time.

Q. 13. Are you able to state how many cars the New Jersey Railroad Company owned in September, 1849—passenger, crate, and baggage cars?

A. As near as I can recollect, there were thirty-five passenger-cars, four box-cars, and sixteen or eighteen platform-cars; these sixteen or eighteen platform-cars include all the crate-cars there were, the crate-cars being platform-cars; I had the passenger-cars numbered after I got there, and they numbered up to thirty-five; this includes all the freight-cars and all the cars of any kind on the road; we were not a freight-road at that time.

Q. 14. How many of these freight-cars, if any, ran in the passenger trains at that time?

A. There were not more than four.

Q. 15. Did any of these four have a double-acting brake at that time?

A. They did not.

Q. 16. State, if you know, when double-acting brakes, acting upon both trucks of the cars at the same time from one windlass, were first put in use upon the cars of the said New Jersey Railroad Company, and by whom they were so first applied.

A. They were first put in use in September, 1851, by me.

Q. 17. State what form of such double-acting brake it was that you so applied at that time.

784 A. It was what is called the Tanner brake, I believe—a cross-centre lever under the centre of the car, a rod from each truck to that lever, a rod and chain from each end of that lever to the brake-shafts.

Q. 18. Was there more than one centre lever under the car?

A. There was not.

Q. 19. Why did you introduce this double-action brake upon that road at that time? Please state fully.

A. On account of their applying a double-acting brake on the Camden and Amboy road at that time there was considerable of an agitation with regard to brakes, and I wanted to keep up with the rest; when I saw this brake I found that it was different from the Camden and Amboy brake, and I did not know at the time I commenced putting it on that there was a patent on it at that time, and I considered it less complicated than the other, so I applied it.

Q. 20. You mean by "this brake" the onercentre-lever brake which you applied on the Jersey road?

A. Yes, sir.

Q. 21. Will you describe the construction of the double-acting brake which you say was put at that time on the Camden and Amboy road?

A. It was a brake that was known as the Hodge brake; it had a rod under the centre of the car, with a cross-lever at each end of the rod, hung by two straps or stirrups under the centre of the car; rods attached from these levers to the trucks of the cars, and from these levers to the brake standards at the ends.

Q. 22. Before putting the Tanner form of double-acting brake on the New Jersey Railroad cars, had you seen brakes like it anywhere; and, if so, where?

A. I saw one on the New York and Erie road at Piermont; I also saw one, I think, on the Rensselaer and Saratoga or Schenectady and Saratoga road, but I did not examine it at that time; I examined it closely
when I saw it on the New York and Erie road. The first time I
785 ever saw such a brake was when I saw it on the Rensselaer and
Saratoga or Schenectady and Saratoga road.

Q. 23. In September, 1849, was the said Tanner form of double brake with one centre lever under the car, in use upon any of the cars of the Camden and Amboy Railroad?

A. I never saw any.

Q. 24. At that time did any cars of the Camden and Amboy road come into Jersey City; and, if so, in what trains and how frequently?

A. They came in there two or three times a day on the Philadelphia trains. Every other train was the Camden and Amboy cars.

Q. 25. Where was the car-shop of which you had charge at that time, and where has it been since you have had charge of the car-shop of the New Jersey Railroad Company?

A. In Jersey City, and has been there ever since. They also had a car-shop at East Newark for a me, but they always had a shop at Jersey City.

Q. 26. About when was it that you saw the Tanner form of double brake on the Rensselaer and Saratoga or Schenectady and Saratoga road, and when was it that you saw it on the New York and Erie road?

A. I saw it on the Saratoga road, as near as I can recollect, some time in 1848 or 1849, and on the New York and Erie road in 1850 or 1851.

Q. 27. What kind of brake was on these Camden and Amboy cars which you say above came into Jersey City two or three times a day when you first went into the employ of the New Jersey Railroad Company?

A. The only brake that I ever saw on them was a single-acting brake.

Q. 28. What opportunities did you have at that time of knowing what kind of brakes was on these Camden and Amboy cars?

A. I repaired them when they required it; that is, if they broke down
at our end of the road, we had to repair them and fix them up so
786 that they could go home. If the brakes got out of order, a bolt
broke, or anything of that kind, we repaired them; all incidental
repairing; we had to look over the cars every time they came in.

Q. 29. About how often, as near as you can state, did they require such repairs as these?

A. Sometimes it might not be once a week; sometimes it would be every day; I could not tell exactly.

Q. 30. About how many of these Camden and Amboy cars came into Jersey City daily between September, 1849, and the time when you applied the Tanner brake, in September, 1851?

A. I should judge there was from six to a dozen every day; these were passenger cars and platform crate cars; two full trains.

Q. 31. Did you repair, in the manner you have stated, all these cars, as they required it, during this period?

A. I did whenever they were so that they could not be sent home without being repaired. Once in a while we sent to them to come over and do repairs—wheels and such things.

Q. 32. Could any of these Camden and Amboy cars have had the Tanner form of double action brakes on them for any length of time during the period between September, 1849, and September, 1861, without your knowing it?

A. I should think not; not any of those that came into Jersey City.

Q. 33. You say you applied the Tanner brake on account of the Camden and Amboy road applying the Hodge brake. About how long before you applied the Tanner brake was the Hodge brake applied on the Camden and Amboy road?

A. I can't exactly say. I should judge it was some time in 1850 or 1851.

Q. 34. You say there was considerable of an agitation with regard to brakes at the time you applied the Tanner brake. What was the agitation? Please state fully.

A. There were several brakes then brought into notice, and we
787 tried to keep up with the times. I had no orders about it at the
time, and I applied this brake on my own responsibility.

Q. 35. About how rapidly did you get the Tanner brake into use on the cars of the New Jersey Railroad after first applying it?

A. I should think it took near two years before we got it on all the cars. As fast as we overhauled the cars we put on these other brakes.

Q. 36. After you first saw the Hodge brake on the Camden and Amboy cars, how fast did said brake go into use on said cars?

A. I cannot exactly say; I saw it on several cars. I cannot say how many. I saw the brake before it was applied on the Camden and Amboy cars.

Q. 37. Did you ever see the Tanner form of double brake on the Camden and Amboy cars; and, if so, about when first?

A. I cannot tell exactly when I first saw it. As near as I can remember, I saw it first in 1852, when they put on the brake that operated from the engine.

Q. 38. State, if you know, the name of this brake which operated from the engine.

A. I do not know the name; I have heard it called the McLaughlin brake.

Q. 39. Do you mean that the McLaughlin brake was put on in 1852, or that it was when the McLaughlin brake was put on that you first saw the Tanner form of double-acting brake on the Camden and Amboy cars?

A. I can't recollect the exact date; but the first I recollect of the Tanner brake is, when that McLaughlin brake was put on the Camden and Amboy cars.

Q. 40. Do you remember whether the McLaughlin brake was put on a good many of the Camden and Amboy cars?

A. It was on one train. How many more it was on I do not know.

Q. 41. About how many cars with it on were there in that train?

A. From four to six.

788 Q. 43. Did these cars come into Jersey City; if so, for about how long a time; and how frequently during such time?

A. They did come in there; for how long a time I cannot say; but during the time they did come in, they came in every day, I should think, for a year.

Q. 44. Do you know Henry Tanner, of Buffalo, the patentee of the Tanner patent?

A. I think I have seen him. I do not know whether I should know him now or not if I should see him.

Q. 45. Did he ever come to you at the New Jersey Railroad for the purpose of getting you to introduce upon that road any double-action brake?

A. If I recollect the man right, he came twice, with two different brakes.

Q. 46. About what year was the first time, and what brake was it, or by what name was the brake known, that he wished you to introduce at that time?

A. The first time he came was in 1849. I forget the name of the brake, but it was a brake to operate from the bumpers of the cars.

Q. 47. Was it the Turner brake?

A. I believe that is the name.

Q. 48. Did that Turner brake have a centre lever in it?

A. The thing was so complicated that I can't describe it at this time. There were plenty of levers in it.

Q. 49. What passed between you and him at that time with reference to the introduction of that brake on said railroad?

A. I cannot say what passed. The model of the brake was given to me by the vice-president of the road, he requiring my opinion in regard to the feasibility of using the brake on the road; I pointed out so many objections that he could not answer satisfactorily to the board, that the board refused to have anything to do with it. I gave my objections in writing to the board.

Q. 50. That brake did not go into use on that road, did it?

A. No, sir.

789 Q. 51. About what year was the second time that said Tanner came to you, and what brake did he wish you to introduce at that time?

A. He came to me about the time I was busy in putting the double-acting brake on two cars in the shop in 1851. He claimed that brake that I was putting on.

Q. 52. Did he have with him at that time any model of that brake?

A. I do not think he did.

Q. 53. What conversation or conversations did you have with him at that time in reference to that brake, or the introduction of it on the New Jersey Railroad?

A. I cannot recollect altogether. He wanted that I should put it on a full train of cars, and if it did not work to satisfy us, he would pay for the brake, and pay for putting it on and taking it off. I had the brake partly made when he came there, and had commenced putting it on the cars of the company. I explained the brake that I was putting on, and he claimed it and said it was his brake, and that he had abandoned the other brake.

Q. 54. Was there any more conversation between you, or did he then go away?

A. He might have gone away at that time. There must have been some more conversation, but I cannot recollect altogether what it was; I saw him several times afterwards, and he always talked on that subject when he came there.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says as follows.

Cross-q. 1. Do you know what brakes were in use on the crate, baggage, and passenger cars of the Camden and Amboy Railroad for the six years prior to your entering the employ of the New Jersey Railroad Company in 1849?

A. I do not.

D. H. BAKER.

Subscribed and sworn to before me this 24th day of February, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

790 Further examination adjourned to February 25, 1868, at 11 a. m.

NEW YORK, *February 25th*, 1868—11 a. m.

Present, S. D. Cozzens, esquire, of counsel for complainant, and the complainant in person; and S. M. Whipple, esquire, of counsel for defendant.

SILAS H. BROWN, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows

Q. 1. What is your name, age, residence and occupation?

A. My name is Silas H. Brown. I am thirty-seven years of age. I reside in Jersey City, in the State of New Jersey. I am a blacksmith.

Q. 2. Where are you at present employed?

A. I am not doing anything at present.

Q. 3. Where was your last employment in blacksmithing, and how long did it continue?

A. At the establishment of William Cummings & Son, in Jersey City. They are car-builders. I commenced there in November, 1848, and continued there until the last of June of the year 1867.

Q. 4. Within a few years after November, 1848, when you went into M'r Cummings' employment, did said Cummings build any passenger cars for the Camden and Amboy Railroad, or for the New Jersey Railroad? and, if so, state when and how many cars.

A. We built some cars for the New Jersey Railroad Company, and for the Camden and Amboy Railroad—for both of the roads—between 1849 and 1852, or 1853. I think there were four or five built for the
Camden and Amboy road. I don't recollect the number we built
791 for the New Jersey Railroad. I think it was four, but would not
be positive.

Q. 5. During the time inquired about, did M'r Cummings build any passenger cars for any other railroads in New Jersey; and, if so, what ones and how many cars?

A. We built some cars for the Belvidere and Delaware road; there were cars built there, also, about the same time, for the Mount Holly road; I don't recollect how many; these cars were built much about the same time, 1849 or 1850. I think there were four or five cars built for the Belvidere and Delaware road.

Q. 6. Do you know what kind of brakes were put by M'r Cummings upon these cars? If so, what kind?

A. I do. They were single brakes, to brake from one end of the car.

Q. 7. Did you do any part of the work on any of these single brakes for these cars? If so, what part?

A. I did. I took part in all the work—levers, brake-rods, trucks, and everything that belonged to such work; that is, I mean the Camden and Amboy cars.

Q. 8. You say you mean the Camden and Amboy cars. Did you do any part of the work on the single brakes for the cars built by M'r Cummings during the time inquired of for the other roads you have mentioned—the New Jersey Railroad, the Belvidere and Delaware road, and the Mount Holly road?

A. Yes; I did.

Q. 9. What parts did you do?

A. I worked pretty much at all the work that belongs to the truck—all the brake work that is used on the truck.

Q. 10. Between 1848 and 1853, and after that time, was M'r Cummings quite largely engaged in car-building?

A. Yes; he was.

And being cross-examined by M'r Whipple, of counsel for defendant, the witness deposes and says:

Cross q. 1. By whom was your attention first called to the matter of brakes of which you have testified?

A. By M'r Sayles.

792 Cross-q. 2. What did M'r Sayles say that he wanted to prove
by you; or, in other words, what did he say to you when he called
upon you?

A. He wanted to see some of M'r Cummings' old hands, some who had worked there from along 1849 or 1850, or about that time, to 1853, and whether I recollected anything about some cars that we built for the Camden and Amboy Company. I told him that I did, and about what time they were built. I told him I thought they were built between 1849 and 1853. He wanted to know if I recollected what kind of brakes were used on those cars—whether they were a single brake or a double-acting brake. I told him that I thought they were a single brake, braked only from one end of the car. I told him that I was positive about that, that they were single brakes, because I never saw any other kind of brake but the single brake on any cars that we built in the shop up to that time.

Cross-q. 3. Do you know what brakes were in use on other cars of the Camden and Amboy road from the year 1848 to the year 1853?

A. No, sir; I do not.

Cross-q. 4. Do you know what brakes are in use on the cars of that road at the present time?

A. I do not.

SILAS H. BROWN.

Subscribed and sworn to before me this 25th day of February, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

David T. Jefferies, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

Q. 1. What is your name, age, residence, and occupation?

793 A. David T. Jefferies. I am thirty-nine years of age. I reside at New Brunswick, State of New Jersey. I am a conductor on the Camden and Amboy road.

Q. 2. Have you any other business than conductor? If so, what?

A. I have. I am recorder of the city of New Brunswick.

Q. 3. How long have you been conductor on the Camden and Amboy Railroad?

A. I have been a regular conductor since 1854 to the present time, with the exception of 1857 and 1858. I ran as extra conductor from about 1851 to 1854, and was employed on the road otherwise from about 1846 to 1850. I first commenced work on the road in about 1845 or 1846. I was first employed working for them at Camden, Amboy, Hoboken, Bordentown, Tacony, and Philadelphia, as painter at all these places, having charge of the men at work on the company's work for my father.

Q. 4. Do you remember excursion trains being run at any time on the Camden and Amboy Railroad? If so, when was it?

A. I do; it was about the year 1845 and 1846, or 1846 and 1847.

Q. 5. Did you ever ride upon those excursion trains; and, if so, how came you to ride upon them, and how often did you do so?

A. I did. I rode on them to assist M'r Forbes, the conductor of those trains, in the discharge of his duties. I rode on them quite a number of times. I can't say how often.

Q. 6. State, as nearly as you can, about how often, on an average, you rode upon these excursion trains during the two years you speak of, 1845 and 1846, or 1846 and 1847.

A. I used to ride on them twice a week during the season they were running them.

Q. 7. How long did the season they were running them last?

A. Two and a half to three months.

794 Q. 8. Do you remember a car on the Camden and Amboy Railroad known as the "Tyler car," or the "John Tyler"?

A. I do.

Q. 9. As nearly as you can state, when did you first know of that car?

A. We used to run it on the excursion trains during the years mentioned.

Q. 10. How much of the time, as nearly as you can recollect, was it run on these excursion trains during the years mentioned?

A. To the best of my recollection, that car was on the trains during the largest portion of the time.

Q. 11. Are you able to state what kind of brakes the Tyler car had while it was so run in these excursion trains, as you have said; and, if so, what kind.

A. It had on a single-action brake, that acted on each truck.

Q. 12. Could that brake act on both trucks of the car at the same time from one windlass?

A. No, sir.

Q. 13. Did you frequently notice this Tyler car while it was running in these excursion trains; and, if yea, what led you to do so?

A. I did. I was led to do so from the car's being a much easier riding car than any other on the road, in my judgment, at that time. I, being something of a mechanical turn of mind, used to examine the running-gear of all the cars I came in contact with.

Q. 14. Did you use to examine the running gear of this Tyler car; and, if yea, about how often did you do so?

A. I used to look at it almost every time I came where it was.

Q. 15. What led you to look at it so often?

A. It being an easy riding car, and all the railroad men, when they met together, would talk about it, and we would get together and look at the gear, the springs, and the construction of the car, that we might observe what new improvements were being made.

795 Q. 16. What were the subjects connected with it that the men talked about at these times?

A. The springs and the running gears, the way it was set on the trucks, and such like matters.

Q. 17. What were some of the peculiarities of the Tyler car, if you remember?

A. I don't know that I can say anything special as to any peculiarities about it, only what I have stated.

Q. 18. Do you remember about its having a water-closet on the platform?

A. I do, sir.

Q. 19. At the times mentioned was there any difference between the brakes on this Tyler car and the other brakes then in general use on the cars of the Camden and Amboy Railroad?

A. Not at that time.

Q. 20. Are you able to say about how long that Tyler car continued to run, either in excursion trains or any other trains, with single brakes, acting on only one truck at a time?

A. It used to run on the way-lines to Tacony, up to the fall of 1849, with a single brake; then I lost sight of the road for about a year, and when my attention was next called to it, which must have been about 1851 or 1852, it had on the double-lever brake, with a lever on each truck, connected together with rods, which made the brake-wheel on one end operate the brake on both trucks.

Q. 21. What called your attention to it in 1851 or 1852?

A. Riding on the car one morning from Trenton to Tacony, I went on the platform to apply the brakes at the sound of the whistle, and when

I came to wind up the wheel with the handle I found that the most of the pressure was taken off, and spoke about it on our arrival at Tacony, and was informed that the brakeman had applied it at the other end, and I asked the reason of it, and was told that a double brake was on the car. The engineer and the brakeman and superintendent at the depot and myself got down and examined it, and I was shown brakes as described, with two levers, one over each truck. They 796 were cross-levers, hung from the bottom of the car, crosswise of the car.

Q. 22. Do you know the patent name or patentee's name by which this brake, just described, goes?

A. I do not, sir.

Q. 23. Do you know whether the name it goes by is the "Hodge brake"?

A. I did not know it then by that name, but it is about the same as the running gear shown here in this office, which is called the Hodge brake.

Q. 24. At the time you applied the brake on the Tyler car, as you have just stated, in 1851 or in 1852, were you conductor?

A. I was not, sir.

Q. 25. What led you to go out on the platform to put on the brake at that time?

A. I used to ride down by the way-line from Trenton, where I resided, three or four mornings a week, with colors and material for the men to work with at Tacony, and being around the trains so much tried to help them make quick stops by applying the brake of the car in which I rode.

Q. 26. Was this helping on the trains your usual habit at the times referred to, or was it only on the morning you have mentioned?

A. It was my usual custom at that time, when I was at work for the road, to do such things.

Q. 27. You say the Tyler car used to run on the way-line to Tacony up to the fall of 1849, with a single brake. How frequently did you notice it and the brake it had while it was so running on these way-lines?

A. I can't say how frequently—very frequently—say once or twice a week, when I happened to be on it, or when I came where the car was.

Q. 28. Was it running in the Trenton and Tacony way-line on the morning when you applied the brake on it, as you have stated?

A. It was.

797 Q. 29. Was that the first you had ever known of its having a double brake upon it?

A. It was.

Q. 30. You say you ran as extra conductor from about 1851 to 1854. About what time in 1851, as nearly as you can remember, did you first commence as such extra conductor?

A. I could not tell. I followed my business, only occasionally running as extra conductor.

Q. 31. About how long was it after you commenced running as extra conductor that you first saw this double-action brake, with a cross-lever on each truck, on the Tyler car?

A. It was somewhere in the fall of 1851, while I was at work in my business, that I first saw the double brake on that car—I mean while I was painting.

Q. 32. Were you originally a painter by trade?

A. I was.

Q. 33. At about the time you first saw this double-action brake on the

A. I do.

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A. Not at that time.

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A. It was somewhere in the fall of 1851, while I was at work in my business, that I first saw the double brake on that car—I mean while I was painting.

Q. 32. Were you originally a painter by trade?

A. I was.

Q. 33. At about the time you first saw this double-action brake on the

Tyler car in 1851, was there any talk about it on the Camden and Amboy road, which you heard? If so, what?

A. There was. The engineers used to talk about its being much better than the single-acting brake, enabling them to stop quicker.

Q. 34. For how long a time, if you know, did the Tyler car continue to run with this two lever double-action brake on it?

A. I am unable to say.

Q. 35. Do you know whether it so ran for some time?

A. I think it ran for two or three years.

Q. 36. During any part of the time while you knew of the Tyler car, did it run into Jersey City in any trains?

A. It used to run through to Jersey City as an extra car on my train in 1854.

Q. 37. What kind of brake did it have on at this time?

A. It had on a double brake that operated on both trucks.

798 Q. 38. Can you describe in a general way the construction of this brake?

A. There were two cross-levers; it was an exact fac-simile of the Hodge brake shown me at this office last week when I was here; it was a drawing from the Patent-Office that was shown me.

Q. 39. What, if any, difference was there between this Hodge brake with the cross-levers which you saw on the Tyler car in 1854 and the brake with the two cross-levers which you saw on said car in the fall of 1851?

A. I did not observe any difference; they were about the same.

Q. 40. Did you ever see that Tyler car with a double brake of any other construction on it; and, if so, when and what was the construction of such other double brake?

A. I cannot say that I noticed the Tyler car with any other construction of brake on it more than other cars which ran on the road about that time, 1853 and 1854—the time the single lever brake was applied. This single lever brake was placed in the centre of the car, and operated upon both trucks, the same as the double lever.

Q. 41. Was that single lever double-action brake which was so applied in 1853 or 1854 the same as the brake which is now in general use on the Camden and Amboy and New Jersey Railroads?

A. It was.

Q. 42. Did the Tyler car have this single lever double-action brake on it in 1853 or 1854?

A. I think that it did.

Q. 43. At this time, 1853 or 1854, were there a considerable number of cars of the Camden and Amboy road with these single lever double-action brakes?

A. There was quite a number of the Camden and Amboy and New Jersey Railroad cars that ran on our passenger trains that had the single lever double-action brake on.

Q. 44. On these Camden and Amboy cars which had the single centre lever double-action brake on them in 1853 or 1854, by what means was the power applied to brake-up on the trucks?

799 A. By a wheel fixed on the platform, and attaching to the rods with chains.

Q. 45. Was there, in 1853 or 1854, or at any time after those years, any of these Camden and Amboy cars having single lever double-action brakes, in which the brakes were worked in any other way?

A. There was placed on six or eight cars of the Camden and Amboy Railroad a double brake, which, I heard at that time, Mess'rs Van Rensselaer and Stevens had bought of some man—the McLaughlin brake—and applied it to said cars; these cars were run for a few trips on the Amboy road, and then were placed over on the line which ran from Camden to Jersey City; whether they ran them on the Camden and Amboy road, also, I cannot say; this brake was applied by means of two levers projecting out from each side of the platform at both ends of the car, and two levers attached to the engine tender, so that when the engine shut off and came back against the cars it applied the brakes. This brake was used about a year or a year and a half on the road, and was found to be impracticable on account of the brakes sticking when applied, so that sometimes it caused considerable delay to the trains in unloosing the brakes. These brakes were all taken off, and the single lever double-acting brake was applied in their place.

Q. 46. Did these levers which projected out from the platform act as bumpers?

A. They did.

Q. 47. Were there any of these single lever double-action brakes used on the Camden and Amboy cars before this McLaughlin brake was applied to said cars?

A. There was.

Q. 48. Please state about how long before, and when?

A. I think about a year or a year and a half before, along there somewhere; between 1852 and 1853.

Q. 49. Upon how many cars?

A. I am unable to say.

800 Q. 50. What is your best recollection of the year when this McLaughlin brake was first applied on the Camden and Amboy cars?

A. Somewhere about 1854; the first I saw of it was in the fall of 1854, soon after the Burlington accident.

Q. 51. During the interval between the time when you first saw the two cross lever double-action brake, which you have called the Hodge brake, on the Tyler car, and the time when you first saw the McLaughlin brake on the Camden and Amboy cars, about how many of the cars of said Camden and Amboy Company were running with said two cross-lever brake on them?

A. I am unable to say.

Q. 52. Do you know what railroad company operated the Burlington and Mount Holly Railroad and the Delaware and Belvidere Railroad in 1848 and 1849, and subsequently; and if so, what company, and how long has it operated said road?

A. The Burlington and Mount Holly Agricultural Railroad Company, composed principally of the directors of the Camden and Amboy Railroad Company, was operated under the direction and management of a superintendent appointed by the said Camden and Amboy Railroad Company; it was so operated from the commencement of the running of the cars on the road to the present time. The same answer will apply to the Delaware and Belvidere road, with the exception that the directors were different; it was also managed under a superintendent appointed by the said Camden and Amboy Railroad Company; it was so operated from the time of the commencement of the running of the road to the present time.

Q. 53. Do you know what company owned the cars which were used on the said Burlington and Mount Holly road, and said Delaware and Belvidere road, in 1848, 1849, and subsequently?

A. These roads were branches of the Camden and Amboy road, and

the rolling-stock and equipments of both roads were charged to the
road. The superintendents of these roads would order rolling-
801 stock and equipments as needed, and when the receipts of those
roads were not sufficient to pay for them, the means would be
furnished by the Camden and Amboy road.

Q. 54. You have said in your answer to the 33d question that the engineers used to talk about the two cross lever double-action brake which was on the Tyler car in 1851 being much better than the single-acting brake. Was the subject of this brake talked of at that time among any others on that road; and, if so, what was the talk?

A. It was. The talk was on the subject of the double-acting brake on the Tyler car and on some New Jersey Railroad cars. It was commented on by the employees of the road generally, more particularly by the engineers, who decided in favor of the double-acting brake on account of its superiority over the single-acting brake.

And being cross-examined by M'r Whipple, of counsel for defendant, the witness deposes and says as follows:

Cross-q. 1. You say you are conductor on the Camden and Amboy road. Conductor on what kind of a train; by whom employed and paid?

A. I am conductor on the Adams Express freight train from New York to Philadelphia, and the 12 o'clock midnight passenger train from Philadelphia to New York. I am employed and paid by the Camden and Amboy Railroad Company.

Cross-q. 2. On what trains did you run as extra conductor from 1851 to 1854?

A. I ran on the way-lines from Trenton to Tacony, on the way-lines from Kensington to New Brunswick, and on the way-line from Trenton to New Brunswick.

Cross-q. 3. Do you know of your own knowledge that excursion trains alluded to in your answer to the 4th direct interrogatory were run in the years 1846 and 1847?

A. To the best of my recollection, they did about that time.

Cross-q. 4. Do you know they did or did not?

802 A. I know that they did run at about that time, from 1845 to
1847.

Cross-q. 5. What do you mean by the word "about"?

A. Somewhere in these years; in the summers of these years, as I recollect.

Cross-q. 6. What other man, if any, was conductor on those excursion trains besides Mr. Forbes?

A. Andrew Forbes, his brother, Andrew Heath, and Edward Muschamp. Andrew Heath and Andrew Forbes are now living.

Cross-q. 7. Who were engineers and who brakemen on those trains?

A. I am unable to say at present. The only one I recollect is Charles Yundt.

Cross-q. 8. Do you know positively that you rode on said excursion trains in 1846 and 1847?

A. To the best of my recollection I did. If I recollect, those excursion trains only ran two years, and it was either 1845 and 1846, or 1846 and 1847, I can't tell which.

Cross-q. 9. Do you know that the Tyler car ran in said excursion trains in 1846?

A. I do.

Cross-q. 10. How old was you in 1846?

A. Seventeen years old.

Cross-q. 11. Were there a pawl and ratchet on the brake-staffs of the Tyler car?

A. I would not swear positively to there being such at that time; they were placed there soon afterwards.

Cross-q. 12. How soon after?

A. I do not know that I can bring to my mind the time exactly.

Cross-q. 13. Was there in five years from that time?

A. Yes, there was in four.

Cross. q. 14. In answer to the 13th direct interrogatory you say that you being somewhat of a mechanical turn of mind you used to examine the running-gear of all the cars you came in contact with; please describe the running-gear of the Tyler car; state the kind of trucks 803 it had, the way they were connected with the body of the car, and describe the springs used on the trucks of said car.

A. It has now been so long since I have first examined the Tyler car that I do not know that I can describe it minutely. It was a four-wheel truck, with a centre-bearing on and between the wheels, upon which rested a spring, enclosed in iron, of a spiral shape, one end attached to the truck and the other bearing on this iron centre-bearing; the body rested on a bed of spiral springs and connected in the usual way with the centre-bolt, pinned fast to the centre-bearing of the truck. This, to my recollection, composed the running-gear of the Tyler car.

Cross-q. 15. What you say of the brakes on the Tyler car at this time, is it from you recollection merely?

A. From my own recollection.

Cross-q. 16. Do you know Edwin Lockwood, superintendent of the car department of the Camden and Amboy Railroad?

A. Yes, sir, very well.

Cross-q. 17. Do you know William Coulter, conductor on the New Jersey Railroad?

A. I do, sir.

Cross-q. 18. Do you know Benjamin L. Wolcott, at present conductor or ticket collector on the Camden and Amboy Railroad?

A. I do.

Cross-q. 19. Do you think Edwin Lockwood and Benjamin L. Wolcott would be as likely to know what brakes were in use on the Tyler car when run in said excursion trains as you would?

A. M'r Lockwood would be likely to know as well as I what brakes were on the cars; as to M'r Wolcott, I can't say.

Cross-q. 20. Would Charles Yundt, the engineer on said excursion train, be as likely to know what brake was on the Tyler car as you would?

A. Possibly he might.

Cross-q. 21. Speaking of the double-lever brake, which you say 804 was on the Tyler car in 1851 or 1852, you say you went upon the platform of this car, and that when you came to wind up the brake you found that most of the pressure was taken off; do you mean off from the wheels of the car?

A. Off from the brake-wheel, which I had hold of.

Cross-q. 22. Is there any doubt in your mind as to whether this circumstance of taking off the power from the brake-wheel staff took place when you applied the brake?

A. There is none at all, sir.

Cross-q. 23. Was this taking off consequent upon the application of the brake at the other end of the car at the time you were operating at the other end?

A. I take it so.

Cross-q. 24. Assume that ten credible witnesses have testified under oath that a double-acting centre-lever brake was in use on the Tyler car for more than five years prior to 1850, and that these witnesses are or have been employés of the Camden and Amboy road, will you stand up in this court and say that no such brake was in use on said Tyler car during that time?

A. I say, to the best of my knowledge, there was not.

And being re-examined by Mr. Cozzens, of counsel for complainant, he deposes and says:

1. Redirect q. Do you feel positive that there was not?

A. I do, sir.

2. Redirect q. Have you had your attention called to the subject of the trucks of the Tyler car, whether they were four-wheel trucks or six-wheel trucks, so that you mean to be understood that you can now recollect whether they were four-wheeled or six-wheeled?

(Objected to by M'r Whipple as being instructive to the witness.)

805 A. I have not had my attention called to it from that time to the present, and upon M'r Whipple's asking the question it occurred to me that we were using at that time four-wheel trucks, but I would not say positively.

D. T. JEFFERIES.

Subscribed and sworn to before me, this 25th day of February, 1868.

JOSEPH GUTMAN, JR.,
Examiner, &c.

Examination further adjourned to February 26, 1868, at 11 a. m.

NEW YORK, *February* 26, 1868—11 a. m.

Present, S. D. Cozzens, esquire, of counsel for complainant, and the complainant in person; and S. M. Whipple, esquire, of counsel for defendant.

ERASTUS REID, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Erastus Reid; I am fifty-nine years of age; I reside at Newark, New Jersey; my occupation at present is pattern-making.

Q. 2. Were you ever in the employment of the New Jersey Railroad and Transportation Company; and, if so, at what time did you go into their employment, and how long did you continue in it, and in what capacity were you employed by that company?

A. I was. I first entered their employment in December, 1836, and continued with them until August, 1849. I was employed by them in the car department making cars, and repairing in the repairing-shop.

Q. 3. Were you in the car department during the whole time you were employed on the road?

A. Yes, sir.

806 Q. 4. Are you familiar with the construction of what are called single brakes for railroad-cars?

A. Yes, sir.

Q. 5. When you went into the employment of said New Jersey Railroad and Transportation Company in December, 1836, what kind of brakes were in use on the passenger-cars of said company?

A. At that period we had short cars, and used a single triangle brake, operating on only one pair of wheels. At that time the cars were four-wheel cars; they had no truck-cars.

Q. 6. How long, as nearly as you can state, was it before they commenced to use truck-cars on said road?

A. I think about the next summer some time, 1837; it was very soon after I came on the road.

Q. 7. What kind of brakes did they use on these truck-cars?

A. There was a brake with a drop-lever acting on a cam; the clogs were between the wheels under the trucks at that time.

Q. 8. Upon how many wheels did this kind of brake act?

A. Upon four.

Q. 9. These four wheels were in one truck, were they?

A. Yes.

Q. 10. How long did they continue to use this kind of brake?

A. It might have been as long as two years; it was about two years. Those brakes might have been used on some of those cars two or three years after that.

Q. 11. After the drop-lever brake, what was the next one that was used on the cars of said company?

A. They used a crank to wind up and rods to connect; a chain was wound up around the brake-staff to bring the brakes up.

Q. How long, as far as you know, did they continue to use such a brake as this?

A. All the rest of the while that I was on the road.

807 Q. 13. Upon how many trucks in the car did this brake, with the crank to wind up, act?

A. Upon one.

Q. 14. At the time you left the employment of said railroad company in August, 1849, what kind of brakes were in use on the passenger-cars of said road?

A. Such as I have here last described.

Q. 15. Do you know what crate-cars are?

A. Yes, sir.

Q. 16. At the time you left the employment of the said railroad company in August, 1849, what kind of brakes were in use on the crate-cars used on said road, and what kind of brakes were used on the platform-cars of said road?

A. The same as were used on the passenger-cars.

Q. 17. In August, 1849, when you left the employment of said company, were there any other kind of brakes in use upon any of the cars of said company besides single brakes acting on only one truck?

A. Not to my knowledge.

Q. 18. If there had been, would you have known it?

A. I think I should.

Q. 19. How positive do you feel that you would have known it?

A. I feel very positive about it.

Q. 20. During any part of the time while you were in the employment of said company, were there any kind of brakes in use on said road which acted upon more than four wheels at a time?

A. No, sir.

Q. 21. Do you know Joseph F. Talson, formerly superintendent of car-building and car-repairs of said railroad? If so, how long have you been acquainted with him?

A. I do know him, and have been acquainted with him since 1836.

Q. 22. Were you, while you were on said railroad, employed in any capacity under said Talson; and if so, in what capacity and how long?

808 A. I was. After the first two or three years that I was there I had charge of all the work in the shop under him until I left the road; I acted as foreman under him.

Q. 23. While you were so employed, in what shop did they do the brake-work for the cars of the said company; and state whether you had anything to do with such work?

A. The work was done in the car-shop of the company, where I was employed. I did that work with the other work that was done in the shop.

Q. 24. Did that give you full opportunities of knowing what kind of brakes were used on the cars of said railroad while you were in its employment?

A. I think it did.

Q. 25. During any portion of the time while you were employed by said railroad did any of the cars of the Camden and Amboy Railroad Company come into Jersey City? If so, for what portion of such time, and about how frequently did such cars so come to Jersey City?

A. They did. There were two trains of cars a day, with about five cars in each train—ten cars a day in the two trains. I judge they commenced along in 1840 and continued to come there until I left, in 1849; it might have been earlier than 1840 that they commenced coming into Jersey City.

Q. 26. Do you know what kind of brakes were in use upon these Camden and Amboy cars during this period; and, if so, what kind?

A. I do. It was what we call the single-acting brake; it acted on one truck.

Q. 27. How often did you see these Camden and Amboy cars during this period?

A. I saw them every day, I suppose, during week days.

Q. 28. Did you during said period have occasion to do any repairs to said Camden and Amboy cars? If so, what kind of repairs?

A. I did. They were some small repairs, such as a bolt being loose; trifling repairs.

Q. 29. Who had charge of these repairs to these cars?

809 A. They were done by the men that looked after the cars in the depot.

Q. 30. During any part of the time when these Camden and Amboy cars were coming into Jersey City between 1840, or thereabouts, and 1849, when you left the New Jersey Railroad, did any of said cars have upon them any double-acting brakes, acting upon more than one truck at a time?

A. No, sir.

Q. 31. Among said Camden and Amboy cars were there any platform crate-cars during said period?

A. There was one such car in a train; sometimes there were two, but not often.

Q. 32. During said period did any of these crate-cars have upon them any double-acting brakes, acting upon more than one truck at a time?

A. Not to my knowledge.

Q. 33. Could there have been any such brake acting upon more than one truck at a time used upon any of these crate-cars for any length of time without your knowing it?

A. I think not.

Q. 34. How positive do you feel about it?

A. I feel pretty certain about it.

Q. 35. Do you remember any car upon the Camden and Amboy Railroad which was distinguished from the other cars of said railroad by having different kinds of seats in it?

A. Yes, sir.

Q. 36. Were there any other peculiarities about the car besides the seats? If so, what?

A. I don't recollect of any.

Q. 37. Do you remember anything about the springs of the car?

A. No, sir.

Q. 38. Do you recollect what kind of brakes were in use on this car with the different kinds of seats in it? If so, what sort of brakes were they?

810 A. I do. I believe they were the same kind of brakes—common single brakes. I don't recollect of any other kind; single brakes, acting on one truck.

Q. 39. What time, as nearly as you can state, did this car first come out on the road?

A. Somewhere along between 1840 and 1845; I can't say the date of it.

Q. 40. You say you believe this car had the common single brakes. How positive do you feel about it?

A. I have no recollection at all of any other kind; I feel very positive in my own mind about it.

Q. 41. Have you at any time had any conversation with the before-named Joseph F. Talson in regard to a law-suit about double-acting brakes; and, if so, when was the conversation, and what was it, as nearly as you can state?

A. I had a conversation with him last winter some time; I can't recollect the date; he stated to me there had been a law-suit about them; I think he said in Albany; I think that is all he stated about it.

Q. 42. Did he ask you anything about what you knew of the use of double-acting brakes on the New Jersey Railroad while you were employed on it? If so, what did he say?

A. He talked about it, and I did not recollect anything about any other kind of brakes than the common brakes; he talked considerable, telling me many things that I did not know anything about that had occurred after I had left the road. By common brakes I mean the ones in common use at that period, acting on one truck.

Q. 43. Did you tell said Talson that you would testify that Stanley put the brake (meaning a double-acting brake) on the New Jersey Railroad, and that he, Talson, strengthened it, and that it ran on the road? and, if you said anything about this, please state what you said.

A. There was a gentleman came there one time to the New Jersey Railroad shop, of the name of Stanley, I believe, who undertook to make a brake there that acted on both trucks; when he had got it done, as he thought, the car was shoved out of the shop, and as it was on the track the brake was applied, and it all broke to pieces, and that 811 was about the end of it; I have no recollection of the brake's being applied to the cars after that. I never told Talson what is inquired about in the question.

Q. 44. So far as you recollect, did Talson, while he was on said railroad, strengthen said Stanley brake, and did said brake run for any length of time on the New Jersey Railroad?

A. I have no recollection of it.

Q. 45. Could it have run there for any length of time without your knowing of it?

A. I think not.

Q. 46. How positive do you feel of this?

A. I feel very certain of it in my own mind.

And being cross-examined by M'r Whipple, of counsel for defendant, the witness deposes and says as follows:

1. Cross-q. Do you know what brakes were in use on the cars of the Camden and Amboy Railroad from 1843 to the time you left the New Jersey Railroad in 1849?

A. To the best of my knowledge, the single-acting brake, acting on one truck.

2. Cross-q. Had you during that time inspected the cars of said Camden and Amboy road to ascertain what brakes were in use on the cars of that road?

A. We came in contact with them often, and I have no recollection of any other kind of brake than the one acting on one truck; I did not examine them every day, and probably not once a week or month, because that was other men's business directly; by contact, I mean, I noticed them and looked at them.

3. Cross-q. Do you know from personal inspection that there was no double-acting brake on any car or cars of said Camden and Amboy road up to the time of your leaving the New Jersey Railroad in 1849?

A. I never went to inspect those brakes directly myself, because that was the business of others. I have no recollection of anything whatever but the single brake on those cars.

812 4. Cross-q. Then you never inspected the cars of the Camden and Amboy road to ascertain what brakes were or were not on the cars of said road?

A. I never went to do it directly; it was not my business; I did not inspect them any more than general observation of them.

5. Cross-q. Then it is from general observation that you testify, is it?

A. Yes, sir; my being acquainted with them.

6. Cross-q. Were the cars of the Camden and Amboy road taken into the shops of the New Jersey road for repairs when they needed it?

A. No, sir; not while I was there.

7. Cross-q. You not being inspector of cars, what led you to go out of the shop to ascertain what brakes were or were not on the Camden and Amboy cars?

A. I had duties in the depot where they were stationed, and the men reported to me often when there was anything out of order about them, and I had an opportunity to see them.

8. Cross-q. Was it necessary that the men should report to you if a bolt was gone or there was a brake-rod down, or could they go on and repair it?

A. No; they had general orders to make those repairs themselves; they used to talk to me about it and to M'r Talson.

Defendant's counsel now offers in evidence a paper marked "Exhibit 1," which reads as follows:

"Answer to first interrogatory. My name is Erastus Reid; age 58 years; reside 117 Union street, Newark, New Jersey, and my occupation is a pattern-maker.

"Second interrogatory. Were you ever in the employ of the New Jersey Railroad and Transportation Company? If so, when and in what capacity were you so employed?

"Answer. I was, from December, 1836, to the middle of August, 1849; I was during this time employed in the car-shop of that company, 813 and in the absence of M'r Talson, superintendent of the car department, acted as foreman in his place.

"Third interrogatory. While so employed, did you know of a brake being applied to a car of that road by Isaac Newton Stanley? If so, what kind of a brake was it? Please describe it.

"Answer. I did, and will describe it as follows: It was a double brake, with two centre levers, connected with the brakes of both trucks, and with the windlass at both ends of the car, and operated by both windlasses; a model shown me, marked 'Exhibit B,' is a good likeness of the brake applied by said Stanley.

"Fourth interrogatory. How do you fix the date of the application of this brake to a car of said New Jersey Railroad and Transportation Company?

"Answer. I fix it by the fact that M'r Stanley applied to me to build for him a pair of trucks, and, according to the books of that company, the work on these trucks was done in the fall of the year 1842; at this time the brake was applied.

"Fifth interrogatory. Do you know of a modification of this Stanley brake by M'r Talson soon after it was applied by said Stanley? If so, what did the modification consist of? Please explain. And was it used on said railroad?

"Answer. I do, and it had one lever under the body of the car in the place of the two cross levers of the brake Stanley put on, and it was made in a substantial manner, and used on that road so long as I was in the employ of said New Jersey Railroad Company. The brake so modified may be seen on a model shown me, marked 'Exhibit C.'

"Sixth interrogatory. What was the difficulty with the Stanley brake that it was not used on that road after he applied it to the car as stated in your answer to the third interrogatory?

"Answer. The work was too weak; when he applied the brake it broke to pieces, and he went off and left the car, and the brake was 814 taken off and another was put on, as I have described in my answer to the fifth interrogatory."

Signed, Erastus Reid; dated Newark, New Jersey, February 27, 1867.

The witness is now presented with the paper, and his attention is called to the signature, and he is asked:

9. Cross-q. Is that your signature?

(Objected to, unless the paper referred to is annexed to the depositions in this case.)

A. Yes, sir.

And being re-examined by M'r Cozzens, of counsel for complainant, he deposes and says:

1. Redirect q. Do you know in whose handwriting the alleged questions and answers in this paper are?

A. I do not know the handwriting; a paper like this M'r Whipple wrote out in Newark one time.

2. Redirect q. Do you mean M'r Whipple, the gentleman now present?

A. Yes, sir.

3. Redirect q. Are the answers purporting to be contained in this paper what were given to M'r Whipple by you, or were they dictated by you? and if not, state who furnished the language of said answers.

A. M'r Whipple asked questions, and there was considerable conversation going on at the same time; I suppose I answered the questions as they were put.

4. Redirect q. Do you mean that you dictated them just as they were put in that paper?

A. No, sir; I did not understand them as they read now; the answers were generally written out and they were read over, and I was asked if I approved of them or not. I did not understand it, or I could never have said what the paper says I did.

815 5. Redirect q. After the paper was written out as you have stated, did you read it over yourself before signing it?

A. No, sir.

6. Redirect q. Was Talson present at the time the paper was written out?

A. Yes, sir.

7. Redirect q. Did he make suggestions about the wording of the answers?

A. I don't recollect as he did; he talked some there, but I think M'r Whipple wrote out the questions and the answers before I heard anything about them, and then they were read to me singly, each question and each answer.

8. Redirect q. Was that the first time that you had seen M'r Whipple and Talson in relation to this matter?

A. The first time I saw them together.

9. Redirect q. Was anything said to you at that time, or at any time, by either of them, about wanting you as a witness to testify in any case in relation to this brake on the New Jersey Railroad?

A. I think they spoke about it at that time when this paper was written out. They said they would let me know when they wanted me.

10. Redirect q. Did you tell them at the time this paper was written out, as you say, that you did not recollect that this Stanley brake was strengthened and put on by Talson after Stantley tried it?

A. I don't recollect whether I did or not; if there was anything said about it, I did.

11. Redirect q. Did you tell them that you had no recollection of said brake being run on the road, after Stanley tried it?

A. I don't recollect of any such conversation taking place there.

12. Redirect q. Was what purports to be interrogatory 5 in said paper and the answer thereto read over to you before you signed that paper? Please read said question and answer carefully before you answer the question, and please direct your attention to the fact of the
816 manner in which the words "I do, and" at the commencement of said answer are interlined in the answer, and to the fact that the capital "I" which appears to have originally commenced the word "it," following immediately after said word "and," has been scratched out and a small "i" written in its place?

A. I have no recollection. I presume they were. I don't know. I will state that I have no recollection of any modification of the Stanley brake being put on any of the cars of the New Jersey Railroad.

13. Redirect q. Was anything said to you at the time that paper was written about any modification of the Stanley brake being made by Talson after it was applied by Stanley?

A. I don't recollect that there was.

14. Redirect q. What were the models which were shown you at the time that paper was written, and how many of them were there?

A. I think there were no models shown at that time.

15. Redirect q. The paper refers to two models—those are the ones I mean. What were those?

A. M'r Talson was there, previous to the writing of the paper, with the models; at one time he had three, I think; at another time he had two.

16. Redirect q. How sure do you feel that there were no models shown to you at the time the paper was written?

A. I am very certain about it. I think I should recollect if there had been, for I have a distinct recollection of the models shown me at the other times.

17. Redirect q. What were the models which Talson had with him previous to the writing of the paper, and how long previous to the writing of the paper was it?

A. One of the models was a cam-brake—a single brake; and another was the one that they used on the road when I left there, a single brake also, what we call the crank-brake; and the other one was the double-acting brake. This might have been two or three months previous to the writing of the paper, something like that time.

817 18. Redirect q. State, generally, what was the construction of the model of this double-acting brake shown you by Talson?

A. It was a lever in the centre of the car, connected with the two ends by connecting-rods so that they should be operated by the cranks or windlasses of the platforms.

19. Redirect q. Did you say anything to Talson about this brake with a lever in the centre of the car, illustrated by that model?

A. We had some conversation. I don't know what it was.

20. Redirect q. Were you at any time brought over to any office in New York for the purpose of testifying in this suit, or for any other purpose?

A. I was requested to come over by M'r Talson, and came over, as I suppose, to give evidence in a brake case, regarding this double action brake.

21. Redirect q. Where was it you came?

A. To the commissioner's office in Chambers street; I think the commissioner's name was Stilwell.

22. Redirect q. At that time was any model shown you by M'r Talson, or by any person?

A. M'r Talson had a model there that I saw, called the Tyler car, the platform of it and the trucks attached.

23. Redirect q. Was there a brake on that model? and if so, state generally its construction.

A. There was a brake on it; it was what is called the double-acting brake; there was a cross lever in the centre of the car body connected to the ends of the cranks with rods somewhere so that it could be operated; it braked both trucks.

24. Redirect q. Did you have any conversation with Talson about that model, or did he say anything to you about it, and, if so, what?

A. There was some conversation; I don't recollect the particulars about it. I told him I did not recollect about connecting the double brake when I was on the road; the other part of the brake was the same as they used before—the single brake; I told him that I did not
818 recollect anything about those rods connecting to the two ends to
be operated by one windlass. I told him, further, that I had never seen a double brake, only when it was applied to those models; that I had never seen the double brake on the cars up to that time when I was in the office here in Chambers street.

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4. Redirect q. Do you mean that you dictated them just as they were put in that paper?

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A. We had some conversation. I don't know what it was.

20. Redirect q. Were you at any time brought over to any office in New York for the purpose of testifying in this suit, or for any other purpose?

A. I was requested to come over by M'r Talson, and came over, as I suppose, to give evidence in a brake case, regarding this double action brake.

21. Redirect q. Where was it you came?

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be operated by one windlass. I told him, further, that I had never seen a double brake, only when it was applied to those models; that I had never seen the double brake on the cars up to that time when I was in the office here in Chambers street.

25. Redirect q. Did Talson, at that time, say anything to you about whether you would be wanted as a witness in this case; if so, what?

A. I don't know that he did; that is what I came there for.

26. Redirect q. Did he say that you would be wanted?

A. I don't recollect that he did.

27. Redirect q. At that time did M'r Whipple say anything to you about whether you would be wanted as a witness in the case; if so, what?

A. M'r Whipple talked to me a minute or two about the evidence, and I told him that I had never seen such a brake on the New Jersey Railroad as that represented on the Tyler car shown in the office.

28. Redirect q. Did M'r Whipple then say anything about your being wanted as a witness; if so, what?

A. He made one or two remarks, and said that he guessed he would not want me, and then he went away; I talked to M'r Talson a few moments and then went home.

29. Redirect q. At the time that paper was written, if you had understood that there was anything in any of the answers which you were expected to sign or approve of about the Stanley brake being modified by Talson and about that modification being used on the New Jersey Railroad, what would you have said?

A. I would have said that I would not sign the paper, if I had understood the meaning of the paper as I do now.

And being further cross-examined by M'r Whipple, he deposes and says as follows:

1. Recross-q. Where was this paper in question written out and signed?

A. In Newark, at the office of M'r Cyrus Currier.

819 2. Recross-q. Was or was not the subject-matter of the paper fully talked over and explained by models before the questions and answers were written?

A. There was a kind of a general conversation there before the writing commenced; I have no recollection about the models being presented there on that day.

3. Recross-q. Do you swear positively that M'r Whipple presented to you no models before writing this paper?

A. I have not the slightest recollection of them; I do not know how to answer the question any stronger than that.

4. Recross-q. At the time of preparing this paper were models purporting to represent the Stanley brake, marked "Exhibit B," and the Talson brake, marked "Exhibit C," in said paper shown to you before any questions or answers were written or not? If not, please account for their appearing as exhibits in said paper.

A. I don't recollect anything about them or about any models being there at the time that paper was written; I saw models at two different times before.

5. Recross-q. You say you came to the office of M'r Stilwell, in Chambers street, to give evidence for defendant in this case. After returning from dinner, with the expectation of being called upon as a witness, did you complain to M'r Whipple or not that you were sick and wished to be excused for the day, and did he or not, upon this representation, excuse you?

A. I came there with that expectation, of being examined; there was a witness on the stand that occupied the time till 3 o'clock; there was an adjournment of half an hour, and then we met there again; I did not make my plea of being sick to M'r Whipple, because he left before I felt sick; I told M'r Talson that I was sick, and went out-doors.

6. Recross-q. Were you excused on the ground of sickness?

A. No, sir; M'r Whipple left before I felt bad.

7. Recross-q. Did you or not go to and return from dinner with M'r Whipple; and do you swear that you did not meet him in the hall leading to M'r Stilwell's office, and state to him that you were sick and unable to go on as a witness in this case?

820 A. I went with him and took dinner and came back again; when we got in the hall of the building there was some conversation there a moment or two, but I did not tell M'r Whipple that I was sick and wanted to be excused. He left me, as I have stated, before I was taken sick; I am subject to those fainting spells.

8. Recross-q. Did you go home before the court adjourned?

A. I did; M'r Whipple told me he did not want me.

9. Recross-q. Did you or not at the time of preparing this paper aid M'r Whipple what you could to express what you wished to be understood would be your evidence if called upon to be a witness in this case?

A. The subject was talked over there; I could not recollect the words that were said; I did not dictate the article at all; it was written and read to me.

10. Recross-q. Was there a question written or an answer made in that paper the subject of which was not talked over before the writing, or not?

A. There was a general conversation about it, and the article was written out and the questions too, and they were read to me.

11. Recross-q. Did you assent to the answers as being correct?

A. I did; as I understood them at that time.

12. Recross-q. Did you or not tell M'r Whipple at that time that you would testify to the facts set forth in this paper if called upon to do so?

A. I did not.

13. Recross-q. Had M'r Talson talked with you previous to M'r Whipple's calling upon you to reduce your evidence to writing; if so, did he explain to you by model the Stanley and Talson brakes?

A. He did; he called twice with the models which I spoke of before.

ERASTUS REID.

Subscribed and sworn to before me this 26th day of February, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

821 Examination further adjourned to February 29, 1868, at 11 a. m.

NEW YORK, *March* 2, 1868.

Present, S. D. Cozzens, esq., of counsel for complainant, and the complainant in person, and S. M. Whipple, esq., of counsel for defendant.

AMBROSE WARD, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says, as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Ambrose Ward; my age is 56 years; I reside at Altoona, Pennsylvania; I am occupied at present as assistant general overseer and inspector in the car department of the Pennsylvania Central Railroad.

2. Q. How long have you been engaged on the Pennsylvania Railroad, and in what capacity or capacities?

A. I commenced with them on the 13th day of January, 1853, as foreman of their car-shop at Pittsburg. I was there until the 1st of June, 1858, when I went to Altoona and acted there as general foreman in their car department. I acted in that capacity for about seven years, and since then I have been with them as assistant general overseer and inspector of their car-department.

3. Q. Were you engaged on any railroad before 1853; if yea, on what road?

A. I was. I was on the New Jersey Railroad and Transportation Company for about twelve years. At two different times I was on as an extra hand before I went on as a regular employee. It was either in the winter of 1838 and 1839 or 1839 and 1840 that I went as an extra hand for about three months. I was called afterwards again as an extra
hand for a few weeks. The third time that I went on I did so
822 also as an extra hand, and they continued me straight along as
a steady employee. This last time that I went on and continued
was, I think, in the fall of 1841; it might have been 1842.

4. Q. Please state what your particular business was while employed on said New Jersey Railroad and Transportation Company's railroad.

A. It was to make any repairs that might be necessary, mostly about the running gear of all cars, to see that it was in order and keep it up. All cars that came to that depot—the depot at Jersey City.

5. Q. Whom did you work under—I mean who was superintendent of car-repairs and car-building on the said New Jersey Railroad and Transportation Company's road while you were so employed on that road?

A. M'r Joseph F. Talson was superintendent for about nine years; after that M'r David H. Baker came on as superintendent, and I worked under him for about three years.

6. Q. You speak of seeing to the repair of cars that came into the Jersey City depot; was it or not a part of your business while so employed on the said New Jersey Railroad, to examine the passenger trains when they came into the Jersey City depot to see that all the machinery of said cars was in good running order before they left the depot?

A. Yes, sir, that was the general work that I was engaged at.

7. Q. Please state, if you know, what kind of brakes were used on the cars of the New Jersey Railroad and Transportation Company while you were employed on that road.

A. Some cars had a brake only at one end, and some had a brake at each end, though not connected for some years after I commenced with them. There was a brake with a centre lever, put on, which acted on both trucks from either end of the car by having the brakes properly adjusted on each truck. It operated on all the wheels from either end
of the car.

823 8. Q. Please state, if you know, who put this centre-lever brake
that applied the brake to all the wheels from either end on the
New Jersey Railroad cars?

A. To the best of my recollection, M'r David H. Baker put it on, speaking from what I can call up to mind from circumstances.

9. Q. About what year was it as nearly as you can describe, that M'r Baker put on this centre-lever brake?

A. I think it was about 1850. I cannot be positive.

10. Q. May it have been somewhat later than 1850?

A. Well, it may have been 1851; I made no notes of it.

11. Q. Did you ever see a double brake acting on all the wheels of the car from either end, before the time when M'r Baker put on this centre-lever brake?

A. There was a great deal of talk about double brakes about that time, and the Hodge brake came up about then I think. I have not a distinct recollection as to when the Hodge brake was first applied, but my opinion at the time was that Baker's was the best arrangement. I could not state whether it was before or after Baker's brake was applied that I heard of the Hodge brake. I recollect that it was my opinion that the one applied by Baker was the best one I had ever seen. I mean my answer to the question to be that I do not remember whether I saw the Hodge brake before Baker applied his brake or not. It was about that time.

12. Q. Did you ever see a double brake like the one Baker put on before the time when he put it on?

A. No, sir.

13. Q. Was that form of brake which Baker put on, new to you at the time when he put it on?

A. Yes, sir.

14. Q. You have said that it was your business to make any repairs which might be necessary upon all the cars that came to the Jersey City depot; do you include among the cars you so refer to, the cars of the Camden and Amboy Railroad which came to Jersey City?

A. Yes, sir, all cars, to see that they were safe to run, and do what repairs were necessary.

824 15. Q. What kind of brakes were used upon the Camden and Amboy cars that came into Jersey City, prior to about 1850, or prior to the time when Baker applied his brakes?

A. They were single brakes until about 1850; I think about 1850 they began to look for a double brake, as nearly as I can recollect; I don't recollect at what time they commenced using the double connection; the Hodge brake was the only double connection brake that I remember on the Camden and Amboy cars or any cars except the one applied by Baker; anything before that I do not remember.

16. Q. Did the duties which you had to perform in the repairing of these cars require you to know what kind of brakes they had?

A. Not specially so, but if any repairs were necessary, to make those repairs in order to make them safe to run.

17. Q. If the brakes on these cars were out of order did you have to repair them?

A. Yes, any light repairs that were necessary to make them efficient. If badly broken the cars were sent home for repairs; that is the best of my recollection.

18. Q. Do you remember a car on the Camden and Amboy Railroad which had a water-closet on the platform?

A. I do remember a car of that kind; I noticed that particularly because it was so novel.

19. Q. Did that car come into Jersey City often while you were on the New Jersey Railroad?

A. It was there a great many times; I can't say how often it came; I think it was considered an extra car for a while, to run on special occasions.

20. Q. Did you see it pretty frequently during the time it ran to Jersey City?

A. I saw it a great many times; I must have seen it most every time it came there, because I was one of the chief men about the depot. That was my general work, to help about those cars, to keep them in repair.

825 21. Q. What kind of a brake did that car have prior to about 1850, or prior to the time when Baker applied his brake?

A. I cannot state. I have no recollection about that particular car's brake.

22. Q. Did it have a single or a double brake during this time?

(Objected to, for the reason that the witness has stated that he has no recollection of what brake was on said car.)

A. I have no recollection about what brake was on that particular car.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Cross-q. While you were in the employ of the New Jersey Railroad and Transportation Company, to wit, in 1842, do you know of one Isaac Newton Stanley applying a double-acting brake to a platform crate car of that road? If yea, state what you know about it.

A. I remember that M'r Stanley had put something on a car that I never saw. I saw nothing but the staples, where something had been put on and taken off. I never saw it. This was put on between times that I was on the road, I think.

2. Cross-q. Did or did not Joseph F. Talson, superintendent of the car department of that road, apply a centre-lever brake to a crate car of that road about the year 1842 or 1843?

A. Not that I have any recollection of.

3. Cross-q. Do you know James S. Gamble, former conductor of that road?

A. Yes, sir.

4. Cross-q. Do you know William Coulter, conductor on that road for the last twenty years?

A. Yes, sir.

826 5. Cross-q. Do you know John H. Jobes, brakeman on that road during the years 1843, 1844, 1845, and 1846?

A. I do.

6. Cross-q. Did you know George W. Fielder, in the employ of the road about 1845 and 1846?

A. Yes, sir.

7. Cross-q. Do you believe the above-named persons to be credible witnesses in any matter or thing in which they may be supposed to have a personal knowledge?

A. I do.

8. Cross-q. Do you know what brakes were in use on the baggage, crate, and passenger cars of the Camden and Amboy road before the year 1850?

A. I do not recollect distinctly.

And being re-examined by M'r Cozzens, the witness deposes and says:

1. Redirect q. If the centre-lever-brake, applied by Talson to a crate-car on the New Jersey Railroad in 1842 or 1843, had been run on the road for any length of time, would you have known it?

A. I think I must have known it.

And being further cross-examined by M'r Whipple, of counsel for defendant, he says:

1. Recross-q. Do you swear positively and unequivocally that Joseph F. Talson did not put a double-acting centre-lever-brake on a crate-car of the New Jersey Railroad in the fall of the year 1842?

A. I could not so swear, although I have no recollection of it.

AMBROSE WARD.

Subscribed and sworn to before me this 2d day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

827 **JORDAN FERNALD**, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Jordan Fernald; I am fifty-seven years of age; reside at Waverly, New Jersey; I am at present not engaged in business. I have been latterly employed in grading and paving, which I have been compelled to suspend owing to the extreme cold weather.

2. Q. Were you ever in the employment of the New Jersey Railroad and Transportation Company; and, if so, in what capacity and from what time to what time?

A. I was. I commenced there in January, 1835, and I left there in the fore part of 1863. I was employed the first two years as car-driver between Jersey City and Newark while they were using horse-cars. After that as conductor all the rest of the time, except when I was taken off for some purpose.

3. Q. Were you so taken off often?

A. No, sir; not very often; what I mean by being taken off, was when the Hackensack bridge was burnt; I was taken off for about a month while they were building it to superintend the men. I was conductor all the time, and received conductor's wages. I was taken off at another time to act in getting timber to build a bridge.

4. Q. With the exception of such temporary employments as these, were you conductor substantially all the time between 1837 and 1863?

A. Yes, sir.

5. Q. Do you understand the construction and operation of double-action brakes for railroad cars?

A. I think I do.

6. Q. Will you please state at what time, or about what time, double-acting brakes acting on both trucks from either end of the car were applied on the cars of the New Jersey Railroad and Transportation Company?

828 A. The first that I ever saw was beteen 1849 and 1852, except an experiment that M'r Talson tried previous to this time and afterwards abandoned.

7. Q. By whom was the double-acting brake, which you first saw between 1849 and 1852, applied?

A. One of them was applied by M'r Baker, the foreman of the shop at Jersey City.

8. Q. You say "one of them"; how many of them were there, and by whom applied?

A. There was one applied by the Camden and Amboy folks, I suppose. I don't know by whom; it was on one of their cars.

9. Q. Was this brake on one of the Camden and Amboy cars like the brake applied by Baker; if not, what was the difference?

A. The one on the Camden and Amboy cars had two cross-levers under the car-body, and the one applied by Baker had but one.

10. Q. As near as you can state, what year was it when the one put on by Baker was applied?

A. I could not state exactly, but I think in 1851.

11. Q. How near to this time was it that the one applied by the Camden and Amboy road was put on?

A. They both apparently came out together—I cannot say which came out first.

12. Q. Was there any talk or discussion among the railroad hands at the time about this brake of Baker's and the one on the Camden and Amboy road; and, if so, what was the talk?

A. There was. As far as I heard it, the men were discussing which was the best.

13. Q. Prior to the time when Baker applied his brake on the New Jersey Railroad, what kind of brakes were in use on the cars of said railroad during the time you were there and after the company gave up using horse-cars?

A. There were two or three kinds of brakes used. There was one kind with an upright shaft or a crank, another kind with a wheel instead of a crank, and another kind that worked between the wheels by a rock-shaft instead of outside by a rock-shaft and cams.

829 14. Q. Upon how many trucks did these three kinds of brakes act at one time, from one crank or wheel?

A. Upon but one.

15. Q. Do you remember a brake experiment which was tried on the New Jersey Railroad by Isaac Newton Stanley in 1842?

A. I don't remember it by that name.

16. Q. I mean the brake first applied by Stanley as an experiment, and afterwards put on a car by Talson of whom you have spoken?

A. I never knew M'r Stanley in the case. The brake that I mean was put on by M'r Talson.

17. Q. How long did that brake put on by Talson run on the road?

A. I could not say how long it was run on the road. I ran it but once on my train and found it broken when I came into Jersey City. I reported it at the shop, and threatened to report it at the office if it was not altered so that we could depend upon it. I never had it afterwards.

18. Q. What was the trouble with it?

A. It appeared to be light, so that it would break. I could not explain any great trouble, because I never ran it but once.

19. Q. Where did your train run to at the time you had this Talson brake on it?

A. To Kensington.

20. Q. From where to Kensington?

A. Jersey City.

21. Q. Was it one of the regular Philadelphia trains?

A. Yes, sir.

22. Q. What kind of a car was it on in the train at this time?

A. On a flat car—some term it a crate car.

23. Q. After that Talson brake ran that once in your train, was it run for any length of time on the New Jersey Railroad?

A. I never knew it to be run any; it might have been run without my knowledge.

830 24. Q. Could it have been run for any length of time without your knowing it?

A. It might have been, as I never had it on my train at all.

25 Q. I asked you if it could have been run for any length of time without your knowing it, and you say it might have been, as you never had it on your train. Please state what you mean when you say it might have run for a length of time without your knowing it.

A. There were two other trains that ran to Philadelphia that had the same kind of cars on that mine did; I heard them speak of taking off the Talson brake. I mean it might have been run in that situation; might have been fixed and other brakes put on; I understood that it had been abandoned and other brakes put on at the time I reported it.

26. Q. Do you remember a car on the Camden and Amboy Railroad called the "Tyler car"?

A. Yes, sir.

27. Q. About how many years ago did you know of that car?

A. I could not say how many; I should think nine or ten years.

28. Q. What years were those?

A. I think between 1853 or 1854 and 1860; I might have known of it before that; I don't know that I ever saw it before that.

And being cross-examined by counsel for defendant, the witness deposes and says:

1. Cross-q. In the sixth direct interrogatory you say that M'r Joseph F. Talson applied a double-acting brake on a car of the New Jersey road. Will you please describe the said Talson brake?

A. I cannot describe it.

2. Cross-q. Did it have a centre lever under the body of the car, to which were connected the brakes on each truck and the brake-shafts at each end of the car by which the power of the brakeman was applied to the wheels of both trucks from either end? 831

A. I could not say. I never saw it but once, and did not see the brake then; it was in the night.

3. Cross-q. Was it a double-acting brake? If so, what do you mean by a double-acting brake?

A. I could not say whether it was or not.

4. Cross-q. What do you mean, then, by saying that M'r Talson applied a double-acting brake to the car?

A. I didn't mean to have said that.

5. Cross-q. In answer to the sixth direct interrogatory, you say, "the first (alluding to a double-acting brake) that I ever saw was between 1849 and 1852, except an experiment that M'r Talson tried previous to this time and afterwards abandoned." Now what brake did M'r Talson apply and abandon? Was it or was it not a double brake, or was it a single brake?

A. The one that M'r Talson applied was said to be a double-acting brake. I could not say it was myself, for I never saw the part of the brake under the car.

6. Cross-q. Then you know nothing from personal knowledge of what you have testified in reference to the Talson brake?

A. It came in with me one night broken; I know that of my personal knowledge.

7. Cross-q. Do you know William Coulter, James S. Gamble, John H. Jobes, Bernard Hughes, George W. Fielder and Joseph F. Talson?

A. Yes, sir.

8. Cross-q. Please state how they were employed by the New Jersey Railroad and Transportation Company, if they were, prior to 1849.

A. William Coulter was conductor, James S. Gamble was conductor, John H. Jobes was a brakeman a very short time; he was what they termed their greaser, to assist in oiling the cars; Bernard Hughes was depot master; George W. Fielder was track master, and Joseph F. Talson was foreman of the car-shop.

832 9. Cross-q. Do you believe these men to be credible witnesses in any matter or thing of which they may be supposed to have a personal knowledge?

A. I should think they were.

10. Cross-q. Is there any doubt on your mind as to the credibility of any testimony these men might give under oath?

A. No, sir.

11. Cross-q. Do you know what brakes were in use on the cars of the Camden and Amboy road prior to the year 1849?

A. The cars that were sent over the New Jersey road that we had to use had a single-acting brake on each truck.

12. Cross-q. Do you know of your own personal knowledge from personal inspection of cars, that no cars of the Camden and Amboy road came to Jersey City prior to the year 1849, with double-acting brakes on one or more cars?

A. I do not.

JORDAN FERNALD.

Subscribed and sworn to before me this 2d day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination adjourned to March 3, 1868, at 3 p. m.

NEW YORK, *March* 3, 1868.

Present S. D. Cozzens, esquire, of counsel for complainant, and the complainant in person, and S. M. Whipple, esquire, of counsel for defendant.

THOMAS O'MAHONY, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

833 Q. 1. What is your name, age, residence, and occupation?

A. My name is Thomas O'Mahony; I am about 58 years of age; I reside at Piermont, New York. I am a car-builder by occupation.

Q. 2. By whom are you at present employed, and how long have you been so employed?

A. By the New York and Erie Railway Company. I have been employed by that company for about two years.

Q. 3. Are you acquainted with double-acting brakes and single-acting brakes for railroad cars?

A. Yes, sir.

Q. 4. Were you ever in the employment of the New Jersey Railroad and Transportation Company; and, if so, when did you enter their employment, and how long did you remain with them?

A. I have been in their employment. I went into their employment in 1846, and left them about seven years ago.

Q. 5. What sort of work did you do for them while you were with them?

A. Car work and building baggage-crates, and whatever there was to do in the shop with regard to cars.

Q. 6. Did this car work which you did include the repairs of cars?

A. Yes, sir.

Q. 7. At the time you went into the employ of the New Jersey Railroad Company, in 1846, what kind of brakes were in use on the cars of said road?

A. Single brakes, if any. Whereever there was a brake put on, it was a single brake.

Q. 8. About how much of the time while you were in their employ since 1846 did they continue to use the single brakes on their cars?

A. I was there three years, and I saw nothing else but single brakes during those three years on that road. I could say that I was on that road four years before I saw anything else but a single brake.

Q. 9. At the end of the time you have mentioned, what kind of brakes did you see there?

834 A. Baker—David H. Baker—came to the shop as foreman, and after he had been there about eighteen months or two years, about 1851, we had a double brake put on.

Q. 10. Do you remember about what year Baker came there?

A. About 1849.

Q. 11. What kind of brake was it that Baker put on in 1851?

A. It was a double brake, that braked on the two trucks.

Q. 12. While you were on said road, and previous to the year when Baker put this brake on, did you have occasion to see all the cars of the New Jersey Railroad from time to time?

A. Yes, sir; I had to work on them all the time. We had but few cars, and we had to work on them regularly.

Q. 13. Do you remember the platform crate-cars which were run in the Philadelphia trains over the New Jersey Railroad between 1846 and 1851?

A. Yes, sir.

Q. 14. Did you at any time have to do any work upon the baggage-crates which were carried on those cars?

A. I built the baggage-crates altogether, and kept them in repair, too; not all the time. I commenced building them in 1848.

Q. 15. What kind of brakes were used on those platform crate-cars between 1846 and 1851?

A. If there was any they were single brakes, I should think.

Q. 16. How positive do you feel of this?

A. When we adopted the double brake there was none on the road before, and if there had been any we should have had them on these cars. I never saw any double brake before 1851, and if there had been any we should have had them on the cars.

Q. 17. You say there were none on the road before; before what, do you mean?

A. Before we put on the one in our shop that Baker put on.

Q. 18. Do you feel sure of this?

835 A. I can't be positive about this; I know there was none on the road before on our cars, and that I never saw one before that one was put on there.

Q. 19. My question was: Do you feel sure that there was no double brake on the cars belonging to the New Jersey Railroad before the time when Baker put his brake on? Please answer this.

A. I am satisfied there was not.

Q. 20. While you were on the New Jersey Railroad, did the cars of the Camden and Amboy Railroad come into Jersey City?

A. Yes, sir.

Q. 21. What kind of brakes were used on those Camden and Amboy cars between 1846 and 1849?

A. As far as I know, single brakes. I have not examined those cars, but I am certain that we should have adopted them before 1851 if there had been double brakes on them.

Q. 22. Adopted what, do you mean?

A. Double brakes.

Q. 23. Were light repairs on these Camden and Amboy cars sometimes done by the men of the New Jersey Railroad?

A. There were repairs done by the men of the New Jersey Railroad, but I had nothing to do with them.

Q. 24. Did you have occasion often to see those Camden and Amboy cars that came into Jersey City between 1846 and 1851 ?

A. I saw them every day.

Q. 25. Could there have been any double brakes on those Camden and Amboy cars which came into Jersey City, between 1846 and 1851, without your knowing it ?

A. There might be; but I do know that if there had been double brakes on those Camden and Amboy cars we would have had them on our cars before 1851, as we should have had to adopt any improvement they had.

Q. 26. At the time Baker put a double brake on the New Jersey Railroad cars in 1851, was the brake he put on a new thing to you, or had you ever heard of such a brake ?

A. It was a new thing.

836 Q. 27. Before Baker put this brake on in 1851, was there, during any of the time while you were in the employ of the New Jersey Railroad, any double brake on any car whatever belonging to said New Jersey Railroad ?

A. I never saw any.

And being cross-examined by M'r Whipple, he deposes and says:

Cross-q. 1. Do you know there was no double brake on a crate-car of the New Jersey Railroad in the year' 1842, 1843, 1844, or 1845 ?

A. I was not at work in the shop in either of those years, and consequently I could not know.

Cross-q. 2. Will you swear positively that there was no double brake on a crate-car of the New Jersey Railroad in the year 1846 ?

A. I should think not. I should think I could swear positively, because there was no double brake on any car of the New Jersey Railroad in 1846, and not until 1851, that I have ever seen, either on a crate-car or on any other kind of a car.

Cross-q. 3. Do you know what brakes were on the baggage, crate, and passenger cars of the Camden and Amboy Railroad before 1849 ?

A. No, sir.

Cross-q. 4. What is your authority for saying that when there was an improvement on the cars of the Camden and Amboy road it would have to be adopted on the cars of the New Jersey road ?

A. Anything pertaining to an improvement. The foreman in the Camden and Amboy shop would come down and give directions about it, and they would be adopted on the New Jersey road. I saw him there two or three times.

Cross-q. 5. Then the New Jersey Railroad at that time was managed by the Camden and Amboy road, was it ?

A. No, sir; there was a kind of influence.

Cross-q. 6. Influence exercised by whom ?

837 A. By the foreman of the Camden and Amboy shop, in regard to improvements. Edwin Lockwood was his name.

Cross-q. 7. Then M'r Lockwood used to come up occasionally to the shops of the New Jersey Railroad and dictate to M'r Talson what improvements he should put on his cars, did he ?

A. No, sir; he used to suggest what improvements would be necessary for the cars. That was our opinion in seeing them and seeing him speak with him.

Cross-q. 8. Is what you have testified to in relation to the use of brakes on the New Jersey Railroad, and the Camden and Amboy Railroad, from recollection or from positive knowledge?

A. From positive knowledge in regard to a double brake and a single brake on the New Jersey road, and in regard to the Camden and Amboy cars from recollection.

Cross-q. 9. May or may not your recollection be at fault in relation to what was in use on all the cars of the Camden and Amboy road?

A. It might in regard to the cars of the Camden and Amboy road, but not of the New Jersey road.

Cross-q. 10. Do you know Joseph F. Talson, James S. Gamble, John H. Jobes, Bernard Hughes, George W. Fielder?

A. I know all of them except Gamble.

Cross-q. 11. Do you believe the four remaining persons to be credible witnesses in any case in which they may be supposed to have personal knowledge?

A. I never knew anything wrong about any of them; that is, so far as Hughes, Jobes, and Fielder are concerned. I should think they were good, honest men. I could say no reason why they should not be credible witnesses.

And being re-examined by M'r Cozzens, the witness deposes and says:

1. Redirect-q. Would anything which Talson, Gamble, Hughes, or Fielder might say about the brakes on the cars of the New Jersey Railroad, between 1846 and 1851, alter your mind about it as you have testified here?

A. No, sir.

838 2. Redirect-q. You said in your third cross-answer that you did not know what brakes were on the baggage, crate, and passenger cars of the Camden and Amboy cars, before 1849. How did you mean to be understood when you said you did not know?

A. Not working at them, or looking at them.

3. Redirect-q. Do you mean not looking at the cars, or not looking at the brakes?

A. I mean not looking at the trucks, taking particular notice of them; the brakes are on the trucks.

4. Redirect-q. You say you saw the Camden and Amboy cars every day; could such a brake as Baker put on the New Jersey cars, in 1851, have been used for any long time on the Camden and Amboy cars which came into Jersey City, between 1846 and 1851, without your knowing it?

A. I should think not, because we should have adopted it right away. It was a new thing when we put it on in 1851, and everybody praised it; and I should have heard of it before if it had been on.

And being further cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Recross-q. You say that you did not work on or look at the Camden and Amboy cars; how then can you say what was or what was not on said cars in the way of brakes, before 1849?

A. I can't say anything about it.

2. Recross-q. Then you don't know of your own knowledge what kind of brakes were in use on those cars before 1849?

A. I do not.

THO'S O'MAHONY.

Subscribed and sworn to before me this 3d day of March, 1868.

JOSEPH GUTMAN, JR., *Examiner.*

Examination further adjourned to March 6, 1868, at 11 a. m.

839 **NEW YORK,** ***March*** **6, 1868—11 a. m.**

Present, M'r Sayles, complainant, in person, and M'r Whipple, of counsel for defendant.

Examination further adjourned to March 7, 1868, at 11 a. m.

JOSEPH GUTMAN, JR.,
Examiner, &c.

NEW YORK, ***March*** **7—11 a. m.**

Present, M'r Sayles, complainant, in person, and S. M. Whipple, of counsel for defendant.

Examination further adjourned to March 9, 1868, at 11 a. m.

JOSEPH GUTMAN, JR.,
Examiner, &c.

NEW YORK, ***March*** **9, 1868—11 a. m.**

Present, M'r Sayles, complainant, in person, and M'r Whipple, of counsel for defendant.

ABRAHAM C. CONDIT, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, and occupation?

A. My name is Abraham C. Condit. I am 45 years of age. I reside at Newark, New Jersey. I am a machinist.

2. Q. Were you ever engaged on a railroad? If so, what road, when, and in what capacity?

A. I was. I was engaged on the New Jersey Raiload and Transportation Company from 1841 to 1851. I went there under instruction two years in the machine shop, and the balance of the time I was on the road as engineer. 840

3. Q. During the time you were engineer on said New Jersey road, do you know what brakes were used on the passenger and crate cars of that road?

A. I do. When I first commenced running they used a great many foot brakes, that were applied by the foot; others worked with a crank and windlass.

4. Q. Do you recollect of any other kind of brakes being used on these cars before you left in 1851? If so, what kind of brakes were they?

A. I recollect just before I left for California, on the 25th day of October, 1851, that there was a double-acting brake put on in September by M'r Baker, and I was the first man to try it, that is, to pull the car with my engine. I was the first engineer that ran the car. And I recollect also of a car known as the Tyler car having Hodge's double-acting brake with two levers in the centre, about three or four months previous to September, 1851.

5. Q. What kind of brakes, single brakes or double brakes, were used on the New Jersey Railroad and Transportation Company's cars during the time you were engineer on that road, up to the time you say M'r Baker put this double-acting brake on in September, 1851?

A. They were all single brakes. There were no double brakes until 1851.

6. Q. Did you often notice particularly the different kinds of machinery on the cars?

A. Yes, sir. I would always notice all the new improvements. I always took a great deal of pains to do so.

7. Q. Please state how this double brake you say Baker put on in September, 1851, was constructed.

A. There was a centre lever near about the centre of the car, and it connected with rods at square angles, on opposite corners, that would always throw the brake-wheel on the right side of the car; it operated upon both trucks from either windlass.

8. Q. You speak of the Tyler car; what company did that car belong to and how long did you know the car?

841 A. It belonged to the Camden and Amboy Company. I was well acquainted with it from 1843 until I went away in 1851.

9. Q. About how often, as near as you can recollect, did you see the Tyler car from 1843 to 1851?

A. I saw it perhaps twice a week, perhaps four or five times a month, perhaps oftener. It would be a common occurrence.

10. Q. What trains were you engineer on during this time, from 1843 to 1851?

A. A part of the time on the Philadelphia trains; a part of the time on way-trains between Jersey City and New Brunswick.

11. Q. What train or trains was this Tyler car in when you saw it?

A. It was in the Philadelphia trains; sometimes it would go out at night for one week, and the next week in the morning.

12. Q. Was there anything peculiar about this Tyler car which caused you to notice it particularly? If so, what?

A. It was a very nice car. It was the first car that I ever saw having twelve wheels under it. It had spiral and elliptic springs; I noticed it on account of people saying it was such an easy riding car, and I examined the springs. There were looking-glasses—four glasses—inside of the car at each end, and it was considered a very nice car at that time, and people talked about it a great deal and made one notice it and see what there was about it. There was a privy on the platform of the car.

13. Q. Do you know of your own knowledge what kind of brakes were used on said Tyler car from the time you first saw it in 1843 up to the time you saw the Hodge brake, or two centre-lever brake, on it in 1851?

A. I do; it was the single lever brake, one on each end of the car. They operated independently of one another.

14. Q. Did this single lever brake on each end of the car operate the brakes on both trucks from one windlass, or on only one truck?

A. Only on one truck.

842 15. Q. Did this Tyler car run in your trains? If yea, about how often, as near as you can recollect, between 1843 and 1851?

A. It did. It might have been every other day for a spell, and it might have been four or five times a month—as much as that; it might have been oftener.

16. Q. During this time between 1843 and 1851, did you or did you not notice particularly the brakes on the Tyler car?

A. I noticed the brakes very particularly when they put on the double-acting brakes, which was in 1851. I got the brakeman to put it on while I was down under the car looking at it. The brakeman was either John Barney or Randall Hagerman. I cannot recall for a certainty which one it was. I may be mistaken in either one, but it was one of the brakemen. I do not think before that there was anything peculiar about the brakes. I am positive there was not. I should certainly have noticed it if there had been. There was nothing but the single-acting brakes on the car until 1851.

17. Q. Please state, if you know, what kind of brakes were used on

the other cars belonging to the Camden and Amboy road between 1843 and the time you first saw this two-centre-lever brake on the Tyler car in 1851. I mean the cars that came into Jersey City.

A. They were the ordinary single-lever brakes. Some had a brake on one end, and some had a brake on each end of the car, but acting independently of each other.

18. Q. When you first saw this double brake on the Tyler car in 1851, did you or did you not hear anything said about it? If so, what did you hear said and by whom?

A. Yes. There was a general talk about among the employees that we would have two brakes put on instead of one, and have the same number of brakemen.

19. Q. What opportunities did you have of seeing other cars of the Camden and Amboy Company besides the Tyler car?

843 A. They have furnished half of the cars that ran on the trains between Philadelphia and Jersey City, and I used to pull their train every other week.

20. Q. Did you or did you not notice the brakes used on said Camden and Amboy cars that came into Jersey City during the time between 1843 and 1851; and if so, what kind of brakes were they—double brakes or single brakes?

A. Yes, sir; I noticed them, and I am positive they had nothing but single brakes until 1851.

And being cross-examined by Mr. Whipple, of counsel for defendant, he deposes and says:

1. Cross-q. Were you ever in the employ of the Camden and Amboy Railroad Company?

A. No, sir.

2. Cross-q. Do you know from personal inspection what brakes were on all the passenger, crate, and baggage cars of the Camden and Amboy road from 1843 to 1851?

A. My knowledge is limited to the cars that came into Jersey City.

3. Cross-q. Did you personally inspect all the cars of the Camden and Amboy road which came into Jersey City with special reference to the brakes on said cars?

A. I used often to look at them because the leather would wear off and the brakes would not hold, and I used to go and look at the brakes myself to see if the shoeing was off. I have often done this for my own benefit.

4. Cross-q. Then you examined the brake-shoeing particularly, did you, and not the mechanism by which the brakes were operated?

A. I examined the brakes all through. It was a second nature to me. If there had been anything new I should have seen it. I examined the brakes all through often.

5. Cross-q. That is by personal inspection daily during all this time, did you?

A. I did not inspect them daily. It might be twice a month.

844 Whenever the brakes did not hold as they should I went to look at them—whenever we drilled our train after we pulled it out of the pit.

6. Cross-q. Then you inspected them twice a month during all this time, did you?

A. As often as that; perhaps oftener.

7. Cross-q. The Tyler car among the rest?

A. Yes, sir, when we had it.

8. Cross-q. The Tyler car ran regularly in the Philadelphia train, did it not, from 1843 to 1851?

A. I don't think it did run as regularly as the other cars.

9. Cross-q. How often did it run?

A. I have had it a week at a time in my train.

10. Cross-q. Has the Tyler car and its peculiarities been fresh in your recollection ever since you first knew it, as you say, in 1843 to 1851?

A. I have not thought anything of it within the last six years until M'r Sayles spoke to me about it last week; then I recollected it very well.

11. Cross-q. Did M'r Sayles state to you the peculiarities of the Tyler car?

A. M'r Sayles did not. He asked me if I recollected the Tyler car, and what was peculiar about it.

12. Cross-q. What did you say to him?

A. I told him I recollected the car. He wanted to know what was peculiar about it. I told him that it was a very nice car—that it was a very nice riding car; had four looking-glasses in it. He asked me if I recollected of a privy being on the platform, and I told him I did. He asked me if I knew anything about the brakes on it, and if I was acquainted with the Hodge brake, and I told him yes. He then asked me it I had ever noticed the Hodge brake on that car. I said I would have to think about it a bit; that I had left railroading and would have to sleep over it; that I knew there was a double brake on the car in 1851. I told him that I noticed it was a twelve-wheel car, and had spiral and
elliptic springs. There were different kinds of seats in the car,
845 some of one kind and some of another. It was beautifully fitted
up for those times—the nicest car there then was in the country.

13. Cross-q. All this, then, you told M'r Sayles without any prompting on his part, did you?

A. Yes, sir; M'r Sayles was a perfect stranger to me.

14. Cross-q. Have you seen or heard read the evidence which has been taken in this case by defendant, much of which relates to the Tyler car?

A. I heard a portion of it read after I had told him about it; and he then said, "That corresponds with one of my witnesses." I have not seen any evidence or heard any read which was taken for the defendant. I thought you meant the prosecutor.

15. Cross-q. Has M'r Sayles, the complainant in this case, informed you what point or points he wished to prove by you?

A. No, sir.

16. Cross-q. Have you sworn by Thomas Sayles, the complainant in this case, or by Abraham C. Condit, the witness?

A. I don't understand that. I should like to have it explained.

17. Cross-q. Question repeated.

A. I would like to have the gentleman explain what he means by that. I don't understand it.

And being re-examined by Mr. Sayles, the witness deposes and says:

1. Redirect q. In the last cross-interrogatory you are asked if you have sworn by Thomas Sayles, the complainant in this case, or by Abraham C. Condit, the witness. Please state whether you have sworn from information derived from any one or from your own personal knowledge as to the facts in the case.

A. I know the nature of an oath. I have sworn to the facts from my personal knowledge and observation. I have no interest to do any other way.

846 And being further cross-examined by M'r Whipple, he deposes and says:

1. Recross-q. Then you have not been biased at all in your testimony by the complainant in this case, have you?

A. I have not.

A. C. CONDIT.

Subscribed and sworn to before me this 9th day of March, 1868.

JOSEPH GUTMAN, Jr.,
Examiner, &c.

Examination further adjourned to March 10, 1868, at 11 a. m.

New York, *March* 10, 1868—11 a. m.

Present, M'r Sayles, the complainant, in person.

John Leach, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is John Leach; I am sixty years of age. I reside at Taunton, Massachusetts. I am a machinist and engineer.

2. Q. What is your business at the present time?

A. My business now is to take out locomotives and deliver them to any part of the country for the Taunton Locomotive Manufacturing Company, and put such locomotives in running order. I have been so employed over thirteen years. When I am not employed in this branch of the business, I work as a machinist in their shop.

847 3. Q. Were you ever employed on the Long Island Railroad? If so, when and in what capacity?

A. I was employed by the Long Island Railroad Company at the commencement, in 1836, as master mechanic, and in 1844 I was appointed to superintend the running of the trains, and also had charge of the entire mechanical department of the road. I made out all the time-tables, and the rules and regulations, and the instructions to run by. I continued with the road in that capacity until the 31st of August, 1847, at which time I left the road.

4. Q. Do you know what kind of brakes were used on the cars of that road during the time you were on it?

A. Yes, sir. The brakes that we were using were single brakes, that braked on one truck.

5. Q. Are you acquainted with the construction and operation of what is known as the double-acting car-brake? If so, please describe it.

A. I am. The brake connects a lever in each truck to a lever in the centre, by screwing up on one windlass, and operates the brakes on both ends of the car. It has the same effect on both trucks by screwing up on one windlass of either end of the car.

6. Q. Please state where and when you first saw the double-acting brake, which you have just described, with a lever under the centre of the car.

A. I first saw such a brake some time after I left the Long Island road. I cannot tell the exact date. I first saw it either on the Boston and Providence road, or on the Harlem Railroad. I think it was on the Boston and Providence road.

7. Q. Do you or do you not know, of your own knowledge, whether there were any double-acting brakes, operating the brakes on both trucks from a windlass on either end of the car, in use on any of the cars of the Long Island road while you were employed on said road?

A. I know there was not.

8. Q. What opportunities did you have of knowing what kind of brakes were used on the cars of the Long Island road while you were on it?

848 A. By my having charge of the mechanical department of the road, giving directions for alterations or improvements, and by riding over some portions of the road most every day—I residing at Jamaica, and going to Brooklyn most every day to see the president for instructions. If there were any general repairs to be done to the cars, I would examine them to see what was to be done.

9. Q. How positive are you that there was no double-acting brake used on the cars of that road while you were employed there?

A. I am very positive, because the president and I had consultations for the adoption of some plan to stop the train more quickly, we having adopted a very high rate of speed in 1844, when we opened the road through to Greenport, at which time we commenced to run the Boston trains. Somewhere between 1843 and 1845 or 1846 we had had two applications that I recollect more particularly, for brakes to stop the trains more quickly. One of them was a brake with the ordinary shoe and levers, with a chain that ran from under the platform of one car to under the platform of another car and connected the two levers from the truck of each car with chains and pulleys, in such a manner that by winding up on the truck of the one car it wound up on the truck of the other. Another feature of it was that if, by accident, one car became uncoupled from another the chain would throw the whole momentum on the brake of the other car. This brake did not connect the brakes between the two trucks of the same car, but only from one truck of one car to the nearest truck of the next car. We tried this, but it did not give satisfaction, and the man took it off and took it away. The man that brought us this brake was named Skinner. The other brake was a truck, built expressly to try this brake. That was a sort of a clutch, that let down upon the rail, and, by some apparatus, held on to the rail. We tried this brake with an engine, and when we let down the clutch on the rail it threw the truck off the track, and that was the end of that. We adopted the plan of having extra brakemen, so that
849 there would be one brakeman to each car who could apply the brakes on the two adjacent platforms of two cars, each car having a single-acting brake on each end of the car.

10. Q. Do you know Uriah Van Voorhis; and, if so, when did you know him and where?

A. I do know him. I knew him between 1844 and 1847, at the Long Island Railroad depot, in Brooklyn.

11. Q. What was his business there?

A. His business was the making up of the trains and making some slight repairs to the cars, to see that they were oiled and in condition to go out with the trains.

12. Q. How often did you see this Van Voorhis?

A. Nearly every day. Van Voorhis, with all others in the mechanical department and connected with the running of the trains, were under my control and supervision until two or three months before I left.

13. Q. Who was president of said Long Island road between 1844 and August, 1847?

A. George B. Fisk was president until the spring or early summer of 1847, until the election for officers of the road of that year. M'r Weeks then became president of the road.

14. Q. About how often did you see the president of said Long Island road between 1844 and the time you left?

A. Nearly every day except Sundays, and sometimes Sundays we had a Sunday train.

15. Q. In case any improvement was to be tried on any of the cars of that road from 1844 to the time you left in August, 1847, who would be applied to with regard to the trying of such improvement?

A. Application would be made to the president or to me, or to both of us. If the president were applied to, he would refer it to me, as a matter of course. No improvement could be put on the cars without my directing it.

16. Q. During this time, from 1844 to the time you left the road, whom did you have as foreman of the car-shop?

A. John Areson.

850 17. Q. In case any improvements on the cars were to be made, whose business would it be to put them on the cars of that road during that time?

A. I gave my orders in regard to those things to M'r Areson, who was my foreman in the carpenter department, and he would have them done according to my directions.

18. Q. During this time, between 1844 and the time you left the road, the 31st of August, 1847, did Uriah Van Voorhis have charge of the repairs of cars of that road? If so, please state to what extent.

A. It was a part of his duty to see to such slight repairs as would be needed daily; any general repairs or alterations had to be done at the general repair shop at Jamaica; if there was a bolt out or a brake wanted leathering or anything of that kind, he had authority to have it done; anything further than that, he would report to me, and I would have the cars sent to the general repair shop at Jamaica.

19. Q. Could any double-acting brake have been applied to a car of that road, at the depot at Boooklyn, by Uriah Van Voorhis, between 1844 and 1847, when you left the road, without your knowledge?

A. It could not.

20. Q. Why could it not?

A. Because it would have been impossible to have had a brake of that kind applied when we were so much in need of one, without my knowing it. All improvements, alterations, or patents that were applied to the road while I was there had to be done by my directions.

21. Q. During the time you were on said road what kind of brakes were used on the eight-wheeled freight cars of that road?

A. The single-acting brake on one end of the car.

22. Q. When was your attention first called to this double-acting brake matter recently, and by whom?

A. Some time during last summer, in July or August, by a gentleman whose name I have since ascertained to be Whipple. I have learned that he was the agent of the association of the railroads to look
851 up testimony to defend them against the claims of the owners of
patent rights. He had drawings of a double-acting brake with a centre lever which he showed to me and asked me if a brake like that had been applied on the Long Island road while I was there, and I gave him to understand that there had not. M'r Whipple told me that he had been referred to me by M'r Talson, of New Jersey.

J. LEACH.

Subscribed and sworn to before me this 10th day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Edward T. Moore, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Edward T. Moore; I am 53 years of age; I reside at Elizabethport, New Jersey; I am an engineer.

2. Q. Were you ever employed on the New Jersey Railroad and Transportation Company's road? If so, when, for how long a time, and in what capacity?

A. I was engineer on that road; I went there in 1846, and continued there until April, 1851, as engineer.

3. Q. Do you know what kind of brakes were used on the passenger and crate cars of that road while you were so engaged there?

A. I do know.

4. Q. Please state what kind of brakes were used on their cars from 1846 to 1851, when you left.

A. We used to have wooden clogs with leather on; single-acting brakes, operating on only one truck.

5. Q. Are you acquainted with what is known as the double-acting broke? If so, please state how they are constructed and operated.

852 A. Yes, sir; they have a lever in the centre of the car that connects the brakes from each truck, and they are operated on both trucks from either end of the car. I also know of a double-acting brake that has two levers under the centre of the car.

6. Q. Please state when and where you first saw a double-acting brake operating the brakes on both trucks from a windlass at either end of the car.

A. I first saw it on the Central road of New Jersey in about 1853.

7. Q. While you were on the New Jersey road, what opportunities had you for knowing what kind of brakes were used on the cars of that road?

A. I was engineer, and had to see that the brakes were in order, as our stopping powers depended upon them. I used to look to see them when they did not operate right.

8. Q. Could there have been double-acting brakes used on any of the passenger or crate cars of the said New Jersey Railroad while you were employed on that road, and you not know it?

A. No, sir; there could not.

9. Q. What trains did you run on while you were on that road?

A. I ran the mail train on the Philadelphia trains as far as New Brunswick.

10. Q. While you were running on this road, did you have any of the Camden and Amboy Company's cars in your trains? If so, about how often?

A. Yes, sir; generally every other day.

11. Q. Please state, if you know, what kind of brakes were used on those Camden and Amboy cars which were in your trains.

A. Single-acting brakes.

12. Q. While you were so engaged on the New Jersey road from 1846 to 1851, did or did you not know of a car belonging to the Camden and Amboy Railroad Company called the "John Tyler car"?

A. I did.

13. Q. How long did you know that car?

852 A. About three years.

14. Q. During this time did you have this Tyler car in your train? If so, about how frequently as near as you can state?

A. I did. I cannot say how often; it was a great many times.

15. Q. Do you know, of your own knowledge, what kind of a brake was used on this Tyler car during the three years you knew the car?

A. I do.

16. Q. Please state what brake it had on, and how you know.

A. It had a single-acting brake. It never had anything else but a single-acting brake on it while I knew it. I noticed the car particularly, as it was different from the other cars. I think there was a privy on the platform, and it had different varieties of seats in it; it had six-wheel trucks; the handles of the car were silver-plated. I saw the brakes on the car quite often.

17. Q. During the time you were on the New Jersey road from 1846 to 1851, about how many of the Camden and Amboy Company's cars were run in the trains that you were on?

A. About five of their cars in a train; they were not always the same cars, they would sometimes be changed; I mean the cars in the train made up of the cars of the Camden and Amboy Company.

18. Q. During the time you were on the New Jersey road, from 1846 to 1851, could there have been any double-acting brakes used on any of the Camden and Amboy Company's cars that were in your trains for any length of time and you not have known it?

A. No, sir; there could not.

EDWARD T. MOORE.

Subscribed and sworn to before me this 10th day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

854 Further examination adjourned to March 12th, 1868, at 11 a. m.

NEW YORK, *March* 12, 1868—11 a. m.

Present, M'r Sayles, complainant in person, and M'r Whipple, of counsel for defendant.

JOHN T. ARESON, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is John T. Areson; I am 57 years of age; I reside in Brooklyn, New York; I am superintendent of car-repairs on the Brooklyn City Railroad.

2. Q. Were you ever employed by the Long Island Railroad Company; if so, when, for how long a time, and in what capacity?

A. I was; from 1840 to 1861, as foreman of car-repairs.

3. Q. Do you know John Leach; if so, when did you know him first, and where?

A. I do. I knew him first along about 1841 or 1842, on the Long Island Railroad, when I went there; he was there when I went there.

4. Q. About how long did he remain there, and what was his business?

A. Until 1847, if I mistake not; he was part of the time acting as general superintendent; the forepart of the time he did not have as much power as in the latter part.

5. Q. Do you know what kind of brakes were on the cars of the Long Island Railroad during the time said Leach was on the road?

A. Yes, sir; a single brake, that braked from one end of the car.

6. Q. Please state what your opportunities were for knowing what kind of brakes were on the cars of that road during the time inquired of.

855 A. Because I had charge of the car-repairs; they came into the shop that I had charge of for general repairs.

7. Q. Are you acquainted with the construction and operation of the double-acting car brake? If so, please describe it.

A. I am; you take hold of a lever and operate on both trucks from one end—they are connected by rods from a centre lever and then rods to the brake; that is the way they are connected in a horse-car. In a steam-car it is different. In a steam-car there is a rod connected to a centre lever and then to a lever on the brake on the inside of the truck; the connections are both alike from each end, connecting both trucks alike.

8. Q. When did you first see a double-acting brake on a car, and where was it?

A. The first one I saw was one on the Long Island Railroad, which I had put on myself. I should think it was in 1848, as near as my memory serves me.

9. Q. Was it before or after M'r Leach left that road, in 1847?

A. It was after Leach left the road.

10. Q. Please state what kind of a car you attached the double-acting brake to that you spoke of.

A. A baggage-car.

11. Q. Please state how it was attached to the car and how it operated.

A. It had a centre lever and a chain attached to it that came up through the baggage-car over a roller on to a shaft, and a wheel on the end of the shaft that turned it up and braked the car. It was operated on the inside of the car, and operated on all eight wheels.

12. Q. If there had been double-acting brakes used on any of the cars of that road before you put this brake on the baggage-car in 1848, as you state, would you have known it?

A. I should.

13. Q. Did you know Uriah Van Voorhis while on that road; if so, for how long a time did you know him, and what was his occupation while on that road?

856 A. I did know him. I cannot say for how long a time I knew him. He had charge of the cars that ran down to the South Ferry, to do slight repairs and see that they were properly oiled when they went out in the trains.

14. Q. Where were the cars repaired that belonged to that road?

A. The general repairs were done at Jamaica, about eleven miles from Brooklyn. Any small slight repairs he did down at the ferry.

15. Q. In case any new improvements were to be applied to the cars of that road, who would have been applied to with reference to putting them on?

A. I should think the man who had charge of the general repair shop.

16. Q. Who had charge of the general repair shop between 1844 and 1847?

A. I was there as foreman under Leach.

17. Q. Could Uriah Van Voorhis have applied a double-acting car brake, with a cross-lever under the centre of car, and such car have been run on that road for any length of time between 1844 and 1848 and you not to have known it?

A. There never was one applied until I applied it.

18. Q. Did you know a man named Patrick Mitchell on the Long

Island Railroad; if so, what was his business and where was he employed from about 1844 to 1848?

A. I knew him. He came there as helper in the blacksmith shop at Jamaica, and from there he went to the ferry, the railroad-yard at the South Ferry, Atlantic street, Brooklyn, the same yard where Van Voorhis was. He went there, I think, as blacksmith.

JOHN T. ARESON.

Subscribed and sworn to before me this 12th day of March, 1868.

JOSEPH GUTMAN, Jr.,
Examiner, &c.

Cross-examination waived by defendant's counsel.

857 John D. Chapman, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is John D. Chapman; I am 46 years of age; I reside at Brooklyn, New York; I work in the repair shop of the Brooklyn City Horse Railroad.

2. Q. Were you ever employed on the Long Island Railroad; if so, for how long a time and in what capacity?

A. I was. I went there first somewhere about 1846, and went to work at the Jamaica shop, in the carpenter's department, under M'r Areson. I remained there in the neighborhood of a year or a year and a half, and then was discharged and remained out one day, and then went back again and stayed there at work several years.

3. Q. Please state if you know what kind of brakes were used on the cars of that road when you went there.

A. They were single brakes, on four wheels—one truck.

4. Q. Please state, if you know, about how long they continued to use this single brake on all of the cars?

A. I cannot tell exactly; they ran some time. It may be two years, or a year and a half.

5. Q. Are you acquainted with the construction and operation of double-acting car brakes? If so, please describe them.

A. Yes, sir. It is a brake that operates upon the whole eight wheels from either end of the car.

6. Q. Please state, if you know, when and where you first saw a double-acting car brake on a car.

A. On the Long Island Railroad. I cannot tell distinctly when, but it must have been between the time I first came there in 1846 and along in 1848 or 1850.

7. Q. Please state, if you know, who had the first double-acting brake you ever saw attached to a car.

A. M'r John Areson.

8. Q. What kind of a car?

858 A. It was called a baggage car.

9. Q. What opportunities did you have of knowing what kind of brakes were used on the cars of the Long Island Railroad up to the time M'r Areson put this double brake on that baggage car?

A. I had a hand in almost every car that was repaired there.

10. Q. Did you know M'r John Leach, the general superintendent of that road?

A. Yes, sir; I knew him as general superintendent.

11. Q. Do you know about what time he left that road?

A. I stood near him when his discharge came to him, but I could not say what year it was in. I was in the employ of the road at the time. I can't tell you what date it was.

12. Q. Do you recollect whether it was before or after he, M'r Leach, left that road that M'r Areson put this double brake on the baggage-car you have spoken of?

A. It was after.

13. Q. Could there have been any double-acting brakes used on any of the passenger or baggage cars of that road for any length of time from the time you went there, in 1846, to the time M'r Areson put this double brake on the baggage car, and you not have known it?

A. No, sir.

14. Q. What kind of brakes were used on the freight cars of the Long Island road previous to the time M'r Areson put the first double brake on the baggage-car you have spoken of?

A. Single-acting brakes on one end of the car only.

15. Q. What kind of brakes were continued in use on the freight cars while you were employed on that road?

A. Single-acting brakes.

JOHN D. CHAPMAN.

Subscribed and sworn to before me this 12th day of March, 1868.

JOSEPH GUTMAN, JR.,
Examiner, &c.

Cross-examination waived by defendant's counsel.

859 WILLIAM FREDERICKSON, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows?

1. Q. What is your name, age, residence, and occupation?

A. My name is William Frederickson; I am 42 years of age; I reside at Williamsburgh, New York; I am a blacksmith.

2. Q. Were you ever employed by the Long Island Railroad Company? If so, when, and in what capacity?

A. I was; first as a helper in the blacksmith's shop in 1845. I worked as a helper just a year and eleven months in the machinists' blacksmithing, and then M'r Leach put me in the shop with the carpenters to do the car-work—the blacksmithing for the car-work. I remained on the road until about 1861.

3. Q. Please state, if you know, what kind of brakes were used on the cars of that road when you first commenced there.

A. The single brake.

4. Q. Was the single brake used on all of their passenger and baggage cars?

A. Yes, sir.

5. Q. Do you understand the difference in the operation of the single-acting brake and what is called a double-acting brake?

A. I have made the iron-work of both.

6. Q. Where and when did you first see a double-acting brake attached to a car?

A. On the Long Island road; I should think about the latter part of 1847 or 1848.

7. Q. By whom was the first double-acting brake you ever saw attached to a car, if you know?

A. By M'r John T. Areson.

8. Q. What kind of a car was it to which M'r Areson attached this brake?

A. A baggage car, I think.

9. Q. Please state how this brake operated.

860 A. There were two levers to each truck, the front lever under the platform attached by rods. When you screw up the brake on the inside of the car, it drew from the forward lever, and the back lever had another rod connected to it to the front of the truck, if I remember right. All that I saw of it was that I made the rods and levers, and when it was on I went out and looked at it.

10. Q. Do you recollect whether there was or was not a long cross-lever under the centre of the car?

A. I don't remember of any such lever.

11. Q. Were there any double brakes attached to passenger-cars while you were on the Long Island Railroad? If so, when first, if you know, and how were they constructed?

A. There were new cars came there with them on. I don't think I could tell the year they came in—about 1851 or 1852. They were attached by long rods running from truck to truck. There were two levers to each truck; the forward lever was very crooked; the back levers were straight. If I remember right the long rods had a sort of swivel with a hook so that they could be hooked in the levers.

12. Q. Were these double brakes that came there on the passenger-cars differently constructed from the one M'r Areson put on the baggage-car?

A. Yes, sir.

13. Q. State, if you know, what name this double brake that came on the passenger-cars was known by.

A. I never heard it called by any name, not to my knowledge.

14. Q. Please state the difference, if you can, between the operation of a double-acting brake and a single-acting brake.

A. One takes effect on four wheels and the other on eight wheels, don't it?

15. Q. Do you know of your own knowledge whether one applies the brakes to only four wheels from one windlass and the other to eight wheels?

861 (Question objected to as assuming to instruct the witness.)

A. I believe it does; the double-acting brake must apply the brake to eight wheels from one end; I am certain it does; I have tried it often enough.

16. Q. How positive are you that the double brake M'r Areson put on the baggage-car you have spoken of was the first double-acting brake you ever saw on a car?

A. I often had to go out and jack up the cars, overhaul the trucks, and put in new brasses; then I had a chance to see whether there was a double brake or not. I am positive that the brake I saw M'r Areson rig up on this baggage-car was the first I ever saw. I never saw one before, except a grappling-brake.

17. Q. Are you or are you not able to describe all the peculiarities of the brake that M'r Areson attached to the baggage-car you have spoken of?

A. It is a great while ago since I made the iron, but I think I can come pretty close to it if I think of it. There was a brake-wheel inside of the body of the car, with a shaft attached to it; a chain ran down through the box from the shaft to the bottom of the car, and a chain attached that passed through the eye of the chain that came from the shaft, and then the chain attached to the rods and the rods to the lever. There was no centre lever under the body of the car; I am sure of it.

18. Q. You say there was no centre lever. Please state how that applied the brakes to both trucks without a centre lever.

A. I think I made a mistake, when I come to think it over; there was but one lever in a truck, instead of two; the forward lever hung by the forward brakes attached by a jaw, and from the bottom of the lever to the back brake-beam a rod was attached, and four springs in a truck to throw the brake-shoes off. From the top of these levers that hung to the front brake there was a rod passed within about three feet of the box, with an eye in it, and the same from the other end of the car, and then there was a chain from the shaft with a ring in the end of it, 862 and the chains that connected the lever in each truck were made fast to this ring in the chain, and passed through to the other lever in the other truck, so that by winding up the windlass it operated the brakes on both trucks without a centre lever.

19. Q Could there have been in use on any of the passenger or baggage cars of the Long Island road double-acting brakes operating on the brakes of both trucks from one windlass, for any length of time, from the time M'r Leach sent you into the shop to do the blacksmith work for the carpenter shop, up to the time M'r Areson put this double brake on the baggage-car, and you not have known it?

A. No, sir.

W. FREDERICKSON.

Subscribed and sworn to before me this 12th day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Cross-examination waived by defendant's counsel.

Examination further adjourned to March 13, 1868, at 11 a. m.

NEW YORK, *March* 13, 1868—11 a. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

Examination adjourned by consent to 3 p. m. of same day.

863 3 p. m., same day.

Present, the complainant and his counsel.

Examination further adjourned to March 14, 1868, at 11 a. m.

NEW YORK, *March 14th*, 1868—11 a. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

JOHN T. ARESON, recalled as a witness on the part of the complainant, and having been duly cautioned and sworn, deposes and says as follows:

19. Q. You stated in your deposition the other day that you applied a double-acting brake on a car on the Long Island Railroad in 1848, and you described that brake as having a centre-lever; did you about this same time put upon the Long Island road any other kind of double brake?

A. Yes; I used a chain.

20. Q. Will you please look at the drawing now shown you and marked "Complainant's Exhibit 1, New Proofs," and state what it represents?

A. That is the same thing as that which I put on with the chain.

21. Q. What kind of a car did you put this brake, shown in the drawing, on?

A. A baggage-car.

864 22. Q. About how near together in point of time was the brake with the centre-lever which you described the other day as applied by you in 1848, and the brake represented in the drawing, put on?

A. It was not a great way apart. I cannot say exactly.

23. Q. Can you state about how many months apart?

A. Some two, three, or four months.

JOHN T. ARESON.

Subscribed and sworn to before me this 14th day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Cross-examination waived by defendant's counsel.

PATRICK MITCHELL, a witness called on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Patrick Mitchell. I am 38 years of age. I reside at Hunter's Point, Long Island, New York. I am foreman over a gang of men at the round-house of the Long Island Railroad.

2. Q. When did you first go into the employment of the Long Island Railroad Company?

A. In the neighborhood of 1845.

3. Q. Did you know John T. Areson, who was formerly employed on the Long Island Railroad?

A. Yes, sir.

4. Q. Did you also know John Leach, who was employed on that road?

A. Yes, sir.

5. Q. When you first went into the employment of the Long Island Railroad Company, what kind of brakes were in use on the passenger-cars of said company?

A. Single brakes.

865 6. Q. And what kind on the freight-cars of said company?

A. At that time they were single brakes.

7. Q. When did you first see any double-acting brakes acting on eight wheels of a car from one windlass?

A. In about 1848.

8. Q. What railroad was it on?

A. The Long Island Railroad.

9. Q. What kind of a double-acting brake was it? Please describe it.

A. It braked with two levers on the inside of the car, connected by a chain. The levers were on the inside part of the truck, one lever in each truck. There was a chain leading from the top part of the levers to the bottom of the car, to the chain that went to the windlass up inside of the car. There was a rod from those levers to the outside of the trucks.

10. Q. Please look at the drawing shown you, marked "Complainant's Exhibit 1, New Proofs," and state what it represents.

A. That is the brake that I have been describing, only these levers are on the outside of the truck in the drawing. There was also a brake put on the road which had the levers on the outside of the truck as in that drawing.

11. Q. Was there any other kind of brake acting on eight wheels put on the Long Island road in 1848, or about 1848, besides the kind you have described?

A. Yes, sir; there was a brake acted with the levers with a cross-lever underneath the car. That cross-lever was connected from the lever of the trucks, and also by a chain with the windlass that went up in the inside of the car.

12. Q. Who put on these kinds of brakes which you have described, so far as you know?

A. I suppose by M'r John T. Areson. They were put on in Jamaica.

13. Q. What kinds of cars were these kinds of brakes that you have described put upon?

A. We call it a baggage-car.

866 14. Q. Were these kinds of brakes you have described as put on by M'r Areson the first double-acting brake of any kind which were put on the cars of the Long Island Railroad while you were in their employment?

A. They were the first I saw on the road.

15. Q. Could any double brakes have been on the road before these kinds you have described, without your knowing it and seeing them after you went there?

A. No, sir.

16. Q. When did you first see on said Long Island Railroad any double brakes acting on eight wheels of a car from a windlass at either end of the car?

A. It must have been along in 1851 or 1852 somewhere.

17. Q. What cars were these brakes on which you saw in 1851 or 1852?

A. Passenger-cars.

18. Q. Do you know whether those cars were built by the Long Island Railroad Company, or were they built elsewhere?

A. They bought them new, already built.

19. Q. Were the double brakes on them when they came on to the road?

A. Yes, sir.

20. Q. Please state how you know that there were no other double brakes acting on eight wheels from a windlass at either end of the car on the Long Island road before these cars came on in 1851 or 1852?

A. I worked in their employ, and worked on the cars, and they could not have been on unknown to me.

21. Q. Do you remember an accident on the Long Island Railroad? And, if you do, state about when such accident was, and whether, after such accident, you received any particular instructions from the president of said road, and, if yes, state what such instructions were.

A. There was an accident. There is a grade where they run the cars into the depot in Brooklyn. When they cut loose the train, it was run in by the brakeman, and the chains of the brakes broke, and the cars struck the other cars in the depot, and mashed them up, and
867 they came near running into the river. This was some time between 1849 and 1850. I received instructions from the president to go and examine the brakes every day, and see that they were in running order.

22. Q. For about how long a time did you continue to examine the brakes every day under these instructions of the president?

A. While I remained at the South Ferry; until we left it in about 1861.

23. Q. Do you know a man named Uriah Van Voorhis, who was formerly employed on the Long Island Railroad?

A. Yes, sir.

24. Q. When did you first get acquainted with him?

A. I have been acquainted with him since 1847 or 1848.

25. Q. Were you acquainted with him at the time he came back to the Long Island road, in about 1847, after having been away from there some time?

A. Yes, sir.

26. Q. Where was Van Voorhis employed after he so came back in 1847, and what sort of work did he do?

A. He was employed at the South Ferry as yard master, in seeing over the cars.

27. Q. Did he have charge of repairs of cars, and, if so, of what kind of repairs?

A. He had charge of the cars for the repairs that were done there, very light, as to the running gear, and making up trains to see that they were right. The general repairs were done at Jamaica.

28. Q. Were any double-acting brakes put on any of the Long Island Railroad cars at South Ferry, Brooklyn, after Van Voorhis went back there in 1847, and between that time and 1851 or 1852?

A. None.

29. Q. Were there any put on any cars anywhere on the road between 1847 and 1851 or 1852?

A. Those that I have spoken of on the baggage-cars; no other.

30. Q. Who did the blacksmithing for the Long Island
868 road at South Ferry, from the time when Van Voorhis went back
there in 1847, up to 1851 or 1852?

A. I did. A part of the time I had another man employed with me.

31. Q. If any double brakes had been put on the Long Island Railroad cars at South Ferry, after Van Voorhis went back there in 1847, and up to 1851 or 1852, who would have done the blacksmithing-work on such brakes?

A. I would.

PATRICK MITCHELL.

Subscribed and sworn to before me this 14th day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Cross-examination waived by defendant's counsel.

Examination further adjourned to March 16th, 1868, at 11 a. m.

NEW YORK, *March 16th*, 1868—11 a. m.

Present, M'r Sayles, complainant, in person, and M'r Whipple, of counsel for defendant.

JOHN D. CHAPMAN recalled as a witness on the part of the complainant, and having been duly cautioned and sworn, he deposes and says as follows:

16. Q. Please look at the drawing now shown you marked "Complainant's Exhibit 1, New Proofs," and state what it represents.

A. That represents the first double-acting brake that I ever saw work on the Long Island road.

17. Q. Was there any other kind of a double-acting brake used on a car of that road about the same time you first saw one like said exhibit? If so, please describe it.

869 A. There was an alteration. The brake hung in a little different form, some time within a few months of this in the exhibit. The difference in the other one was that there was a center cross-lever, single lever, and double levers, finally, but it was some time after. I can't say exactly the day or the month. There were improvements came up later.

18. Q. Where was the centre cross-lever attached to the car?

A. Hanging to the bottom timbers about the centre of the car.

19. Q. Please state what your business was on the Long Island road, and where you were located between 1847 and 1852.

A. I was stationed at Greenport. It was along in the next spring after Leach had left—about six months after M'r Leach left—that I went there. I remained there four years. My business there was to see that the running parts of the freight, baggage, and passenger cars were in order. In fact, during the time quite every car that they owned came there, and locomotives also.

20. Q. During the four years you were at Greenport, what kind of brakes were used on all the cars, passenger, baggage, and freight, that came to Greenport?

A. Single brakes.

21. Q. Were there any double-acting brakes used on any of the cars of that road during the four years you were at Greenport? If so, on what cars?

A. I can't remember of seeing any brake rigged to work on all eight wheels—that is, to brake on the eight wheels—during the time that I was there.

22. Q. You speak, in answer to question 17, about a brake like Exhibit 1, and another brake with a cross-lever under the centre of the car; please state what kind of cars they were on.

A. The first that I can recollect was a car called the mail-car and to carry the baggage, that was called the baggage-car. The next one was also a baggage-car. The first I saw was with two levers under the body of the car, that I can remember.

870 23. Q. Please state as near as you can what year it was when you first saw these double brakes on these baggage-cars.

A. It must have been along from 1850 to 1853; if I could remember the date when I first went there, I could tell the time. It can't be far from the years I speak of.

JOHN D. CHAPMAN.

Subscribed and sworn to before me this 16th day of March, 1868.

JOSEPH GUTMAN, J'R.,
Examiner, &c.

Cross-examination waived by defendant's counsel.

Examination further adjourned to March 17th, 1868, at 11 a. m.

NEW YORK, *March 17th*, 1868—11 a. m.

Present, M'r Sayles, complainant in person, and M'r Whipple, of counsel for defendant.

Examination further adjourned to March 18th, 1868, at 11 a. m.

NEW YORK, *March* 18, 1868—11 a. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

THOMAS SAYLES, complainant, called as a witness on his own behalf, and having been first duly cautioned and sworn, deposes and says as follows:

1. Q. Are you the complainant in this case?

A. I am.

871 2. Q. Did you about the time when you acquired an interest in the patent upon which this suit is brought, have occasion to visit the Camden and Amboy Railroad for any purpose; and, if so, about when did you go there, and whom did you see, and for what purpose did you go?

A. In the month of July, 1852, I made arrangements with M'r Henry Tanner to try to introduce his patent brake, for which I was to have a certain portion of the proceeds. In the latter part of that month I started from Buffalo, New York, where I was living at that time, and came to New York by way of Dunkirk on the Erie Railroad. I saw the Erie Railroad Company first. I then went to Jersey City and saw M'r David H. Baker, who had charge of the car department of the New Jersey Railroad and Transportation Company, and saw some of the Tanner brakes on their cars. From there I went to Bordentown, New Jersey, and saw M'r Edwin Lockwood, the superintendent of car-repairs of the Camden and Amboy Railroad. My object in going there was to introduce the Tanner car-brake on that road. This was about the last of July or first of August, 1852.

3. Q. Please state fully what conversation, if any, took place between you and said Lockwood at this time.

A. I showed M'r Lockwood at this time the letters patent for the Tanner patent. He told me that he had seen a model of the same thing some time before this, shown to him by a man who said his name was Tanner, but who was a stranger to him, but that their company had made arrangements with Hodge to use his patent brake. He did not know whether they had paid him for his patent or not, but he had had orders to put the Hodge brake on their cars. He was at this time putting the Hodge brake on some two or three cars, and I saw the Hodge brake at that time on one or two of their cars on the track. I told him that M'r Baker was putting the Tanner brake on the New Jersey Railroad cars. We had quite a long argument at this time as to which of the two brakes, the Tanner brake or the Hodge brake, was the best.
He thought the Hodge brake had some advantages over the
872 Tanner, and that the Tanner had some advantages over the
Hodge. He said that if he had seen the Tanner brake before they had made arrangements for the Hodge, he thought he should have recommended their company to use the Tanner brake. He said he had seen the Tanner brake on the New Jersey cars that Baker had put on, and the principal reason of his liking the Tanner brake was that it did not require the taking up of so much slack when they applied the brake by the windlass; for in the Hodge, he said, they had to take up the slack of both ends before the brakes could be brought to bear on the wheels, while in the brake Baker put on, the cross-lever being fastened in the centre of the car, they would only have the slack of one end to take up before the brakes could be brought to bear on the wheels. I contended that the Hodge brake infringed the Tanner patent, and that if they used the Hodge brake they would have to pay for the Tanner

patent also. He said he could not see how that could be, when the Hodge patent was granted first. He admitted that if the Tanner patent dated back of the Hodge patent, that the Hodge patent would infringe the Tanner patent. This is the substance of the talk I had with him at this first interview. There was a great deal more said at this time.

4. Q. You say there was a great deal more said at this time. Please state what it was.

A. We had a long talk about the advantages of using the double brake, of the saving of one-half of the brakemen at least, stopping the trains more quickly, saving of wheels from their not being so liable to slide them, etc. This in fact was the first railroad party that I had had a very long talk with, as it was the first road that I had called on where they were not using the Tanner brake. The New York and Erie Railroad Company were using the Tanner brake, and also the New Jersey Railroad Company, which were the only two that I had visited since I had undertaken to introduce the patent, my object being at this time to get the brakes in use or tried on the roads, not to try to sell the right. I should think that I spent with M'r Lockwood at this time from
873 an hour to an hour and a half, and as he seemed to be very friendly and willing to talk, and it being rather new business to me, I was anxious to get all the information that I could get with reference to car-brakes. I cannot state all that was said between us. I cannot recollect it. I have given the substance of all the conversation that I had with him.

5. Q. Did you at this interview solicit Lockwood to apply and try the Tanner brake, that is, the form of double brake having a single centre-lever under the car-body?

A. I did.

6. Q. Did he say anything to you about such a form of double brake with a single centre-lever under the car-body having been in use on the Camden and Amboy cars?

A. He did not. All he said about such single centre-lever brake, or about his seeing it before, was that he saw some that Baker had put on the New Jersey cars and a model that had been shown to him some time before by Tanner, of the same thing.

7. Q. Did you afterwards have occasion to see Lockwood again; and, if so, when, and for what purpose? and state the conversation, if any, which took place.

A. I did have occasion to see Lockwood again; I think it was in the latter part of 1853. It was soon after an amended answer was filed, or notice of special matter, in the case of Henry Tanner against the New York and Erie Railroad Company on the same patent concerned in this suit, where they set up the Isaac Newton Stanley brake as being used on the New Jersey Railroad and Transportation Company. I called on M'r Lockwood at this time to ascertain, if I could, whether that Stanley brake had been used for any length of time between Jersey City and Philadelphia. I was told in Jersey City that it was a brake that had a cross-lever, or levers, under the centre of the car, and that it had run through to Philadelphia, but could not find any one in Jersey City that knew much about it, and thought that if it had run for any length of time over the Camden and Amboy road that I would be likely to learn something about it from Lockwood. M'r Lockwood told me that
874 he thought it could not have run long on the road, or he should have seen it or heard something about it. I told him it was said to have been put on in 1842. He said he never had heard or seen anything of it or of any other double-acting brake until Hodge came there

with a model of his brake some two or three years before this, when they went to work and put the Hodge brake on some of their cars, and they liked it and had bought the right to use it.

8. Q. Did Lockwood, at this second interview, say anything about his having seen a model of the Tanner form of double brake; that is, with a single centre-lever? If so, what did he say?

A. He did; he said, about the time he saw this brake with a centre-lever, that Baker put on the New Jersey Railroad and Transportation Company's cars, he saw a model that Tanner brought there to show him, which had a cross-lever on the centre of the car, the same as Baker had put on the cars.

9. Q. Did Lockwood, at this second interview, say anything to you about double brakes with single centre-levers having ever been used on the cars of the Camden and Amboy Railroad?

A. He did not.

10. Q. Did you, either at the time of this second interview of yours with Lockwood or at the time of the first interview with him that you have spoken of, see many of the Camden and Amboy cars? And, if you did, what kind of brakes were on them?

A. I did, at both interviews, see quite a large number of their cars—passenger and baggage cars, or crate cars. The first time that I was there, in 1852, all the cars I saw had the single brake on, except, I think, two cars I saw with the Hodge brake on, and they had two or three cars, passenger cars, in the shop on which they were putting the Hodge brake at that time. The second time I was there I saw the Hodge brake on quite a number of cars, and I saw the Stevens-brake on one car. All the other cars that I saw had on the single-acting
875 **brake, operating on one truck only. I mean the passenger and baggage cars; I did not examine the freight cars that I recollect of**

11. Q. And you saw no single centre-lever double-brakes on any of their cars at any time?

A. I did not.

12. Q. Did you, after this second interview, again see Lockwood or anybody connected with the Camden and Amboy Railroad; and, if so, when was it, and how came you to be there?

A. I did see Lockwood a number of times after that, and also the superintendent, M'r Van Rensselaer, and the president of the road, M'r Stevens. The first time I saw them after this was soon after the trial with the New York and Erie Railroad on this same patent, which was tried in October, 1854; and at this time I saw on some of their cars this single centre-lever Tanner double-acting brake, in connection with another brake they called the McLaughlin brake, which they applied by slacking the engine. This was in November or December, 1854. My object in going there at this time was to satisfy them that they were infringing the Tanner patent by the use of the Hodge, and to get a settlement with them.

13. Q. What took place between you and any of the officers of the Camden and Amboy Railroad, in respect to a settlement with you? State fully.

A. M'r Van Rensselaer, the superintendent, refused to settle with me, because he said he had understood that the New York and Erie Railroad Company had appealed the case, but that if that case was finally decided in my favor he thought they would settle with me. He said he could not understand how the Tanner patent could be valid when the Hodge and Stevens patents were both issued for substantially the same

thing as the Tanner before the Tanner patent; but he said that he would submit the matter to their board of directors. I saw M'r Edwin Lockwood at this time, and showed him the decision in the Erie case, and showed him where the Hodge brake was decided to be an infringement, and the Stevens also, and told him that now I had seen that they had put the Tanner brake on their cars with the McLaughlin.
876 He said they had put the centre-lever brake on because they could not apply the McLaughlin brake so well with the Hodge brake. Some time after this, I think in the spring of 1855, I saw M'r Stevens, the president of the Camden and Amboy road, with regard to a settlement with their company. He told me he had heard something about the affair, and that he would make inquiries, and if they were using my patent, or infringing it, they would pay me. He said he would have the matter submitted to their board of directors, and asked me to call on them again. I did call on them again, and was told that they had forgotten to submit it to their directors, but would do so at the next meeting, and when I called the next time they again told me that they had forgotten to submit it to their directors. I finally called there about the middle of November, 1855, when I was told by M'r Van Rensselaer that it had been submitted to their directors, and he was authorized to settle with me, and he did settle with me for the right to use the Tanner patent car-brake.

14. Q. How much did the Camden and Amboy company pay you for this right to use the Tanner patent?

A. They paid me $1,350.

15. Q. Did you give them a license in writing; and, if so, have you a copy of it which you can annex?

A. I did give them a license in writing, but I did not keep a copy of it, and have no copy.

16. Q. Have you, since the present further proofs in this suit were commenced to be taken, caused a request to be made, through M'r Van Rensselaer, of the Camden and Amboy Railroad Company, to produce this license, or a copy of it, to be annexed to the record in this case? If yea, have they produced it?

A. I have caused such a request to be made of M'r Van Rensselaer, and it has not been produced.

17. Q. At any time, while your negotiations for this settlement were going on with the Camden and Amboy Railroad Company, was anything said to you by any person whatever employed by said company or connected with it, or did you hear anything in any way what-
877 ever about the use of a single centre-lever double brake on the John Tyler car, or upon any other car on said railroad?

A. I did not hear anything about any such centre-lever brake being used on the Camden and Amboy Railroad at the time I was trying to settle with them, or at any other time until last spring, when this case was opened to let in further proofs, except what I heard about the Stanley brake being used and run over their road in 1842. The first I had heard of the single centre-lever brakes being used on the Camden and Amboy cars was when I saw it on their cars with the McLaughlin brake in the latter part of 1854. I never heard of the John Tyler car before last spring; I mean this last spring when the case was opened for further proofs, was the first I ever heard that the single centre-lever double-acting brake was ever used on any of the Camden and Amboy cars before 1854, and the first I heard of the Tyler car.

18. Q. Have you a memorandum of the sum you received for the

license to the Camden and Amboy Railroad Company, so that you are positive as to the amount and time when it was paid?

A. I have such a memorandum, and am positive as to the amount, and it was paid on the 16th day of November, 1855, and was so put down in my account-book at the time.

19. Q. At any time while your negotiations for this settlement by the Camden and Amboy Railroad Company for their infringement of your patent were going on, was any objection made by them to settling on account of any prior use by them, or within their knowledge, of a double-acting brake?

A. There was not; except that they first contended that the Hodge brake was prior to the Tanner patent.

20. Q. Then, except this matter of the Hodge brake, was there any claim made to you by anybody connected with the Camden and Amboy Railroad during the negotiations for the settlement, or at the time of the settlement, of any prior use by them, or within their knowledge, of a double-acting brake?

878 A. There was not.

21. Q. During these negotiations for a settlement did Edwin Lockwood take part in the conversations relating to them, and did he converse with you about the subject of them?

A. M'r Lockwood did converse with me on the subject on several occasions while I was negotiating with them, and told me that he had advised them to settle with me if the Tanner invention dated back of the Hodge.

22. Q. You say if the Tanner invention dated back of the Hodge; what claim, if any, did Lockwood make about this, or what did he say about it?

A. He said he could not understand how the Tanner patent could be valid when Hodge's patent was granted first, and was for substantially the same thing.

23. Q. Was that all he said in opposition to your claim for a settlement of the company's infringement?

A. It was.

24. Q. With the exception of this claim that the Hodge patent was granted first, and that therefore the Tanner patent was invalid, was anything said to you by anybody connected with the Camden and Amboy road in opposition to your demand for the settlement of the infringement?

A. I think M'r Van Rensselaer at one time mentioned about the Stevens patent also being granted before the Tanner patent; nothing else.

25. Q. M'r Van Rensselaer has testified in this case, in speaking of the settlement made with you in 1855, that M'r Lockwood objected to settling for the Tanner patent on the ground that the brake was in use by the company. Except this claim that because the Hodge patent was granted first, the Tanner patent was not valid, and excepting what M'r Van Rensselaer said about the Stevens patent, was anything whatever told you during the settlement negotiation by Lockwood or Van Rensselaer or by anybody else connected with the company, about the use by the company of the Tanner brake?

A. There was not.

879 26. Q. State whether you informed the Camden and Amboy Company in connection with your demand for settlement that you would sue them if they did not settle.

A. I did tell them, after they had neglected to lay it before their board of directors, as they had agreed, that I wanted their decision in the matter; for if they were not going to settle I should commence suit at once.

27. Q. Did Lockwood, at any time when conversing with you about the Hodge brake, state to you that the Hodge brake was put on the Camden and Amboy cars under his (Lockwood's) protest, or anything to that effect?

A. He never did.

28. Q. Did M'r Lockwood know your name at the time you called on him in 1852 and 1853, and did he know it at the time you were negotiating with the road for the settlement?

A. When I first called on him in 1852 I gave him my name, and when I saw him after that at different times until the settlement was made, he appeared to know me, and I supposed that he did.

29. Q. Did you see said Lockwood from four to six weeks before the 31st day of July, 1867?

A. I did see him in the latter part of June, 1867.

30. Q. What did you go to see him for on that occasion?

A. To learn something about this John Tyler car and the brake that was said to have been used on it.

31. Q. Did you have more than one interview with Lockwood about this time, the last of June, 1867, or within a few weeks of that time? If so, about how many interviews?

A. I had but this one spoken of, except when he was on the stand as a witness in this case.

32. Q. Please state fully the conversation between you and Lockwood at that interview.

A. I found Lockwood in his office at Bordentown. I spoke to him about a new invention for lubricating car-journals, and then inquired of him about a certain statement that purported to have been made by him about a car on the Camden and Amboy road called the John Tyler 880 car, with the centre-lever double acting brake. I showed him a copy of the statement that he had made and asked him if he had made that statement. He told me he had made a statement something like that and gave it to M'r Whipple. I asked him if the statement was true, and he said he thought it was. I asked him if he was not mistaken in regard to the time that brake was put on the Tyler car, and he said he knew the Tyler car was rebuilt in 1843, and that Tyler rode on they car when it was new in June, 1843, and he thought that brake was put on it the time it was rebuilt. He said the car was destroyed some two or three years before this, and he knew that brake was on it when it was destroyed, and had been on for a great while. I asked him why they settled with me in 1855 for the Tanner patent if they had used that brake since 1843. He said their folks would rather pay two or three hundred dollars than to be bothered with a lawsuit. I asked him if he could not recollect better, in 1853, when the brake was put on the Tyler car, than he could then. He said he should think he could. I asked him, then, if he did not recollect telling me at one time when I called on him in 1853, about a brake being put on the New Jersey Railroad and Transportation Company's car in 1842, called the Isaac Newton Stanley brake, and that the first he ever saw anything of a centre-lever brake was about the time Baker put one on a car on the New Jersey road in 1851, and Tanner called there with a model about that same time, and that the first double-acting brake that he ever saw or ever put on a Camden and Amboy car was the Hodge brake. He hesitated some time, and said: "I think I do not recollect that." He said he thought he recollected something about my inquiring of him if he knew anything about this Stanley brake being used on the New Jersey cars. This was the substance of the conversation.

33. Q. Did he seem to remember you at this interview ?

A. When I first met him I mentioned my name to him and told him it had been a long time since I had seen him. He spoke to me in a very friendly manner. I supposed at the time that he did recollect
881 me. I judged, from his manner and friendly way of speaking all through the interview, that he knew me.

34. Q. Did he tell you in that interview that he had no recollection of you, and that he did not know you ?

A. He did not.

35. Q. He has testified that you asked him if he did not recollect your coming to Bordentown with a brake, and that through his recommendation M'r Van Rensselaer had a brake put on the car, and that through his recommendation it was put on. Did you say that to him ?

A. I did not.

36. Q. Did he tell you in that interview that nothing of this kind had transpired—that is, the matter inquired about in the 35th question ?

A. He did not.

37. Q. Did you then in that interview tell him that he must be mistaken, and that you wished to know if you couldn't do something for him to say that he was mistaken as to date, and did you tell him that if he could, that would leave a doubt as to the date of putting the brake on the car, and did you tell him that it was worth hundreds of thousands of dollars to you, and that you had a suit pending at Chicago for forty thousand dollars, and that had it not been for the model called the John Tyler it would have been decided in your favor ?

A. I did tell him that I thought he must be mistaken as to the time the brake was put on the Tyler car. There was nothing else said between us as inquired of in the question.

38. Q. Did he at that interview say to you that he was open to conviction, and that if you could show him he was wrong he would own it, but that he was sure he was right ?

A. He did not say that. He said it was a good while ago, and it was possible that he might be mistaken as to the time. He said when he made that statement to M'r Whipple he thought it was correct.

39. Q. You have stated that Lockwood told you, in the interview which you had with him in 1853, that the first double-acting brake that he ever saw or put on a Camden and Amboy car was the Hodge
882 brake. Are you positive of this, and was the statement which Lockwood made respecting it clear and distinct ?

A. I am positive, and M'r Lockwood seemed at the time to be sure, that the Stanley brake had not been used on the New Jersey car, for he said that if it had been used there for any length of time on the Philadelphia trains he must have seen it, and he knew that the first brake he ever saw that operated the brakes of all the wheels from either end of the car was the Hodge brake, and I recollect that I was well satisfied at the time that the Stanley brake could not have been used very long on the New Jersey road, for if it had, Lockwood would have been likely to have seen it, and then he would not have been so sure that the Hodge brake was the first double-acting brake he had seen. He was very clear and distinct in the statement of the Hodge brake being the first double brake that he ever saw or put on their cars.

40. Q. Do you know Joseph F. Talson, who has testified in this case ?

A. I do.

41. Q. Was he a witness on behalf of the railroad company, defendant in the suit of Henry Tanner against the New York and Erie Railroad Company, tried at Albany, in October, 1854?

A. He was.

42. Q. Were you present during the whole of that trial, and did you hear said Talson's testimony at that trial?

A. I was present during the whole of that trial, and did hear all of Talson's testimony.

43. Q. State what Talson testified to at that trial.

A. Talson stated on that trial that one Isaac Newton Stanley applied a brake to a car of the New Jersey Railroad and Transportation Company in 1842. He said that the brake that Stanley applied was tied up with strings, and that brake failed and did not go into use. He said that he afterwards took that brake off the car and strengthened the rods and applied it to a car mechanically like a certain model which they produced on that trial. He said that brake, as he applied it, ran
883 from Jersey City to Philadelphia, or opposite to Philadelphia, two or three times—it might have been more and it might have been less than three times. He stated that after this brake had run a week it was changed to a single foot-brake, and after he altered this brake to a single foot-brake, there were no double-acting brakes on their cars until he left the road that were acted on by a windlass from either end; that he left the road in the last of August, 1849. He said that the brake he put on had a lever in the centre and each windlass operated both the trucks at the same time. He said the brakes were operated by a rock-shaft and cams between the wheels; that they never were changed to the outside of the wheels. He said that brake would work on a curve, but would not work on a curve so well as the Tanner brake. He said that the one Stanley put on had three or four levers; that when he changed it and put his brake on, he added one transverse lever the same as the model that was shown there. He said that if you take out the arrangement of the brake he put on within the trucks, and put Tanner's arrangement in, you would have the Tanner brake. He said that there was a brake put on the tenders that could not be operated from both ends; that the brake on the tenders did not have an intermediate lever and only a single connecting-rod. He also stated that, after that trial of that brake, they continued to use the single-acting brake on all of their cars.

44. Q. In stating what he testified at that trial, have you made any use of notes; and, if so, for what purpose have you used such notes?

A. I have made use of the notes that were written down at the trial by Samuel Blatchford, esq., one of the counsel for the complainant in the case, for the purpose of refreshing my recollection. I have had these notes in my possession most of the time since the trial.

45. Q. Did Talson ever state to you this: that the only double brake operated from both ends of the car that he knew of up to the time he left the New Jersey Railroad, in 1849, was the brake tried on the New Jersey Railroad in 1842, and abandoned?

884 A. He has told me this a number of times since the trial of 1854.

46. Q. Talson has testified in this case that he told you that it was not the fact that the brake on the New Jersey road was only an experiment, and that it amounted to nothing, and that the facts in the case were decidedly against your patent, and that if he went to Chicago he should so state. Did he ever tell you so?

A. He never told me anything of the kind.

47. Q. Did you, at a time about two years previous to November, 1867, or at any other time, request Talson to go to Chicago to testify in a suit for you; and, if so, in what suit was it, and what did you want him to tesoify to in it?

A. I think it was something over two years ago I called on Talson, and told him I thought I might want him to go to Chicago to testify in regard to the saving of the wheels of the car by the use of the Tanner brake over the old single brake. He told me he was engaged somewhere in Pennsylvania—he told me where—and if I wanted him, telegraph him or write him; that his business was such there that he could leave at any time, and would do so. It was in this same suit against the Chicago and Northwestern Railroad Company that I thought I might want him.

48. Q. Was this after the decision in your favor had been made in the suit, and was the case at the time before the master to take the account?

A. It was.

49. Q. Did Talson make any objection to going in case you should want him?

A. He did not.

50. Q. Did Talson ever at any time tell you what he has testified to in his deposition in this case about the brake on the Tyler car, and about the continuance of the use of the double-acting brake on the New Jersey Railroad which he has spoken of?

A. No; he never told me anything about the Tyler car, or the brakes being continued on the car of the New Jersey road, until since we commenced taking these further proofs.

885 51. Q. Will you state fully what investigations you made prior to the trial in the New York and Erie case, tried in 1854, relative to the alleged facts set forth in the various notices of special matter served in that case, and state whether, in any of these investigations, you heard, or were led to suspect, anything of the existence of a double brake on the Tyler car on the Camden and Amboy Railroad in 1843 and afterwards, or on any other cars on that road, prior to the use of the Hodge or Baker brakes there of which you have spoken, and whether you heard, or were led to suspect, anything concerning the so-called Stanley-Talson brake on the New Jersey road, except what was proved at said New York and Erie trial in relation to it? Also state whether, after that trial, and down to the time of the opening of the interlocutory decree in this case, you ever heard anything of the matters inquired about.

A. I spent considerable time during 1853 and 1854 up to the time of the trial in investigating the different matters set up in the notices of special matter by the defendant in that case. Among the matters that I investigated was a brake said to have been put on cars at Springfield, Massachusetts, about 1843; another was a brake, said to have been put on the New Haven, Hartford and Springfield cars in 1846 or 1847, and in regard to the Isaac Newton Stanley brake, said to have been used in 1842, and I think some other brakes mentioned in the notices of special matter in that case, all of which I investigated very thoroughly at the time. I did not learn anything about the Tyler car on the Camden and Amboy road, and never heard of any double-acting brake ever being used on that road before 1851. And I never heard of any double-acting brake being used on the New Jersey Railroad and Transportation Company's cars before 1851, except the trial of 1842, as proved in the suit with the Erie road in 1854.

I never heard anything of the kind inquired about in the latter part of the question, until about the time that the case was opened for further proofs last spring.

And being cross-examined by M'r Whipple, the witness deposes and says:

886 1. Cross-q. Over how many miles of road did the license, or licenses, which you say you delivered to the Camden and Amboy Railroad Company in November, 1855, convey the right to use the Tanner brake?

A. I cannot tell the number of miles.

2. Cross-q. State as nearly as you can.

A. I do not remember that I ever knew the number of miles. I recollect that at the time I settled with M'r Van Rensselaer, I settled with him at a very low price, for I was very much in want of money at the time, and was compelled to take what I could get. I don't think we reckoned by the mile, and I think there were three licenses given, two for roads that were represented to be branches of the Camden and Amboy road, or belonged to that company, that did not amount to much, as I was told there were but very few passenger cars used on them, and I have no idea now how many miles of road the licenses covered. We lumped it off and he paid me very much less than what I asked him in the first place.

3. Cross-q. Was or was not over two hundred miles of road expressed in said licenses?

A. I cannot tell whether the number of miles of road was mentioned in the license at all. I think not.

4. Cross-q. Was or was there not a larger sum named in said licenses than the amount of money received by you from said company?

A. I do not remember now what sum was mentioned in the licenses.

THO'S SAYLES.

Subscribed and sworn to before me this 18th day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to March 24, 1868, at 11 a. m.

887 NEW YORK, *March 24th*, 1868—11 a. m.

Examination further adjourned to 2 p. m. of same day.

MARCH 24, 1868—2 p. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

THOMAS SAYLES, the complainant, recalled on his own behalf, and having been duly cautioned and sworn, he did depose and say:

1. Redirect q. Will you state whether after the commencement of the taking by the defendant of further proofs in this case you had any conversation with Joseph F. Talson; and, if so, state about when it was, and what the conversation was.

A. I had a conversation with him last fall, after we had commenced taking testimony, with regard to a double brake being used on the Long Island road. M'r Talson said to me at that time that he was sorry I had not employed him in my brake matter before M'r Whipple saw him; if I had, he said, I would have had none of this trouble with this testimony in regard to the brakes being used on these three different roads, the New Jersey road, the Camden and Amboy road, and the Long

Island road. He said that he was the only one that knew anything about it at that time. He said when M'r Whipple called on him he was out of business, and M'r Whipple offered him $5 per day and his expenses if he would go to work and look up testimony to defeat the Tanner patent, and he went to work for M'r Whipple at that time. He said he first went to see M'r Edwin Lockwood, at Bordentown, and when he first spoke to him about the double-centre lever brakes being used on that road, M'r Lockwood did not remember anything about its being used there at so early a date as he afterwards stated. Talson said
888 that he spoke to him about the Tyler car having that break on it, but he said that Lockwood could not recollect anything about it the first time he saw him, and after he had explained to him about the brakes being on the Tyler car, Lockwood wanted a while to think the matter over, and Talson said he told him he would call again, and when he called on Lockwood a few weeks after, Lockwood recollected about the Tyler car having the double brake on it.

And being further cross-examined by M'r Whipple, of counsel for defendant, he says:

1 Recross-q. You speak of the Tanner patent. Please state who is the owner of the said Tanner centre-lever brake patent, granted to Henry Tanner, assignee, July 6th, 1852.

A. I am.

2. Recross-q. When did you come into possession of said patent?

A. I bought a portion of it in July, 1854. At that time some of the territory was reserved, and since that time, at different times, I have purchased the balance of it. I believe I have purchased the patent for all of the territory of the United States. There may be some railroads reserved.

3. Recross q. Who is the complainant in this case?

A. I am.

THO'S SAYLES.

Subscribed and sworn to before me this 24th day of March, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Henry Waterman, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

889 1. Q. What is your name, age, residence, and occupation?

A. My name is Henry Waterman; I am fifty years of age; I reside at Hudson, in the State of New York; I am a mechanical engineer.

2. Q. Are you acquainted with Edwin Lockwood, superintendent of the car department of the Camden and Amboy Railroad?

A. I know M'r Lockwood.

3. Q. State whether you ever had occasion to see said Lockwood in reference to the subject of car brakes; and if you did, please state in what year it was, how you came to see him, and what conversations, if any, took place between you. Answer fully.

A. In the year 1859 I was employed by the Central and New York and Erie Railways, to work up a defence against the Hodge patent. The principal point of our defence consisted in proving the non-utility of the Hodge patent, or that it was no better than the Tanner brake or single-centre lever double brake, which antedated it. It was important that I should find some railroad that had used both comparatively, and the Camden and Amboy was the only one that I found that answered my purpose.

I had learned that they had commenced with the Hodge patent and had removed that kind of brake, and had substituted the Tanner or single-lever brake. I went to Bordentown and saw M'r Lockwood. I think it was some time in the latter part of 1859, a short time previous to the trial at Canandaigua. I told M'r Lockwood my business, that I was defending the railroad against the Hodge patent, and wanted to know his experience with the Hodge and the Tanner brakes. He gave me the history of their operations. He said they commenced with double brakes on their road, with the Hodge patent brake; that they purchased the patent; that they had introduced it generally on their passenger cars. That they had their attention called to a train brake, called the McLaughlin brake, that was a brake actuated by the bumping of the engine and the cars together. To apply this brake, he could not use the
890 Hodge arrangement; that it was necessary to have a centre lever permanent, and that he took off the Hodge arrangement, and applied the centre lever, and found it worked more satisfactorily than the Hodge arrangement. After reciting to him the objections to the Tanner patent made by the plaintiff in that suit, that the brakes could not be shod evenly, and generally act evenly on the wheels, he said he found no such difficulty. I told him that was very important testimony for us, and requested him to go to Canandaigua. He said he could not leave his business at that time, and introduced me to his foreman, M'r Smith. M'r Smith agreed with M'r Lockwood in his opinion of the brakes, and consented to go to Canandaigua. M'r Smith went to Canandaigua and testified in substance as I have stated—that is, that they commenced with the Hodge as a double brake on their road, and that they had since substituted the Tanner, and that it worked in all respects more satisfactorily than the Hodge. I think that is all.

4. Q. Was Lockwood's statement to you that they commenced with double brakes on the Camden and Amboy Railroad, with the Hodge brake, clear and distinct?

A. That was the distinct impression made upon me. It was as distinct as any part of his statement to me.

5. Q. Is your recollection clear and distinct of the conversation which occurred at this interview with Lockwood?

A. I think it is as clear as though it had occurred yesterday—the whole interview, and all that was said. It was a case that I took a great deal of interest in, and I recollect minutely all the circumstances in it.

6. Q. Did you hear Smith testify at the trial at Canandaigua of the case against the Central Railroad you have referred to?

A. I did.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Cross-q. You say you learned that they had commenced with the Hodge brake on the Camden and Amboy road. From whom did you learn this?

891 A. I think it was M'r Baker who informed me, at Jersey City.

2. Cross-q. When did the trial of Hodge against the Central Railroad take place at Canandaigua?

A. I think it was in the latter part of 1859—some time in the autumn.

3. Cross-q. Is your recollection as distinct in relation to the time of said trial as the interview which you have just related with said Lockwood, on matters connected with said trial?

A. No; I think it is not.

4. Cross-q. Have you a distinct recollection when said trial took place?

A. No, sir.

5. Cross-q. Yet you have a distinct recollection of certain conversations in relation to matters connected with said trial, have you?

A. I recollect distinctly almost everything that was said bearing upon that case. The peculiarity of my memory is such that I recollect distinctly mechanical points and mechanical ideas that have occurred almost entirely through my life, yet have very little recollection of dates.

6. Cross-q. Have you seen Edwin Lockwood since that time or the time referred to in your direct examination?

A. I saw him once.

7. Cross-q. Please state when.

A. I think a year after it; I called to see M'r Dougherty, and passed into M'r Lockwood's shop and saw him.

8. Cross-q. Did you or not form a favorable or unfavorable impression of said Lockwood at this first and second interview, as to his veracity in matters of which he may be supposed to have a personal knowledge?

A. I will say that my impressions were favorable of M'r Lockwood.

9. Cross-q. Do you believe M'r Lockwood to be a credible witness in matters of which he may be supposed to have a personal knowledge?

A. I know of nothing unfavorable to M'r Lockwood; my acquaintance with him was brief.

892 10. Cross-q. Had you a case in hand, and M'r Lockwood was supposed to be acquainted with certain facts connected with it, would you deem him a credible witness in such case?

A. I know nothing of my own knowledge against M'r Lockwood.

11. Cross-q. Is it inferred, then, that you would deem him a credible witness, as called for in the above question?

A. I make it a point to consider every one credible until they are proved otherwise.

12. Cross-q. Has M'r Lockwood proved himself otherwise to your knowledge?

A. He has not to my knowledge.

And being re-examined by M'r Cozzens, of counsel for complainant, he deposes and says:

1. Redirect q. May the trial at Canandaigua have taken place at the June term held there?

A. I now recollect standing at an open window, looking out of our room, and think it was earlier than the time I stated.

2. Redirect q. I omitted, before closing the direct examination, to ask you one question, which I will ask now. Did you, when you saw Lockwood in 1859, as you have stated, learn from him anything about a single centre-lever double brake, like the Tanner brake, having been used on the cars of the Camden and Amboy Railroad, in the year 1843 and afterwards?

A. I heard nothing at all.

And being further cross-examined by M'r Whipple, of counsel for defendant, he says:

1. Recross-q. Have you been employed by any party or parties connected with this centre-lever Tanner brake patent to look up and investigate evidence in relation thereto, or in any cases connected therewith?

893 A. I have.

2. Recross-q. By whom?

A. By M'r Cozzens.

3. Recross-q. Please state what you have done for M'r Cozzens in relation to this matter.

A. M'r Cozzens informed me last summer that a defence was to be made in that case by the defendants, upon the ground that some three or four brakes ante-dated the Tanner patent, and stated specially the brake alleged to have been made by M'r Lockwood. He requested me to get at the history of M'r Lockwood's operations, and I went on to New Jersey two or three times on that business.

4. Recross-q. Did you see M'r Lockwood at this time?

A. I did not; I did not go to Bordentown.

5. Recross-q. If this matter was so fresh in your mind, which you have stated in your direct examination, why did you not go direct to M'r Lockwood, and revive the matter in his mind, as it was your business to look after this matter of brakes on the Camden and Amboy road, under the instructions of your employer, M'r Cozzens?

A. It was not considered desirable to go there, as no good could come of it to my employers.

6. Recross-q. What relation do you understand M'r Cozzens to hold in this Tanner centre-lever controversy?

A. Attorney for the proprietors of the patent.

7. Recross-q. Who do you understand to be the proprietors?

A. The heirs of Batchelder & Thompson I have always understood to be the proprietors. I have no positive information, only what I have learned from M'r Cozzens on that point.

8. Recross-q. Do you understand M'r Thomas Sayles, complainant in this case, to have an interest in this patent?

A. I have never had such an understanding; I have understood that he was interested only in the old, unextended patent.

9. Recross-q. Do you understand that M'r Sayles has any interest in the extended term of said patent?

894 A. I have only understood that he had not any interest in the extended patent.

10. Recross-q. Did you have anything to do for any party or parties in obtaining the extension of the said Tanner patent?

A. I had. I made a deposition in regard to its operations and its value.

11. Recross-q. Did you render any further service before or after giving your deposition? If so, what was it? Please state fully.

A. I made two affidavits for M'r Cozzens, in two suits, I think.

12. Recross-q. What suits?

A. Suits brought by M'r Cozzens against two railroads.

13. Recross-q. Please name them; and in whose name were they brought?

A. I think it was the New York and Erie and the Susquehanna roads. I am not positive about it; nor do I recollect the names of the parties. I think it was the trustee of the patent. I was called in very hastily, on my way through the city, and paid but little attention to the details of the case; did nothing to charge my memory.

14. Recross-q. Please state the name of said trustee.

A. James D. Mowry I understood to be the trustee.

15. Recross-q. Have you performed any further service in relation to this matter? If so, please state to what extent.

A. I don't recollect doing anything further. I asked M'r Cozzens to let me off from anything more, and I understood I was let off.

16. Recross-q. Are you in attendance here on subpœna? If so, by whom?

A. I am not subpœnaed by anybody. I stopped to consult M'r Cozzens in relation to some business I have at the Patent Office, upon which I am going to Washington to-night, and I was informed to-day, for the first, by M'r Sayles, that he wanted to examine me.

895 17. Recross-q. Was this the first you had communicated to any party or parties the subject matter of this examination?

A. It is not the first. I had some conversation, three or four months ago, with M'r Cozzens in regard to it. I at the same time urgently requested that I should not be made a witness in the case.

18. Recross-q. Did M'r Cozzens at that time state to you that he should want you as a witness?

A. I don't recollect; it was very indefinite.

19. Recross-q. Did you not expect to be a witness until you came here to-day to consult M'r Cozzens about matters in Washington?

A. I expected that if I appeared here when you were taking testimony, he would probably call me; but I got the impression so much time had elapsed it would be over with.

20. Recross-q. Then you have regarded this matter to which you have testified of so little importance that you would not be called upon to testify unless you incidentally dropped into M'r Cozzens' office?

A. The fact is I have tried to avoid it. I had some business with M'r Cozzens that I ought to have done last week, and I staid away partly on this account.

21. Recross-q. But neither M'r Cozzens nor M'r Sayles have requested you to testify in this case, only as you have incidentally come into the office where the evidence in this case is being taken?

A. There has nothing been said, except what was said to me incidentally when I came here on other business.

And being further examined by M'r Cozzens, of counsel for complainant, he says:

3. Redirect q. You say you have not a distinct recollection when the trial at Canandaigua took place; and you have also said that your interview with Lockwood was shortly before the trial. Whenever that trial occurred, are you sure that your interview with Lockwood was a short time previous to it?

896 A. I should think it was not more than a week before; it was at most a short time before. M'r Smith followed me right up to Canandaigua.

And being further cross-examined by M'r Whipple, of counsel for defendant, he says:

22. Recross-q. Where does the said Smith, who you say testified at Canandaigua, now reside?

A. I do not know. I have not seen him since.

23. Recross q. Do you know whether he is living or dead?

A. I do not.

HENRY WATERMAN.

Subscribed and sworn to before me this 24th day of March, 1868.

JOSEPH GUTMAN, J'r,
Examiner, &c.

Examination further adjourned to March 28th, 1868, at 11 a. m.

MARCH 28TH, 1868—11 a. m.

Examination further adjourned to March 30, 1868, at 11 a. m.

MARCH 30TH, 1868—11 a. m.

Examination further adjourned to March 31st, 1868, at 11 a. m.

MARCH 31ST, 1868—11 a. m.

Examination further adjourned to April 2d, 1868, at 11 a. m.

897 NEW YORK, *April* 2, 1868—11 a. m.

Present, M'r Sayles, complainant in person, and M'r Whipple, of counsel for defendant.

JAMES MCFARLAND, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is James McFarland; I am fifty years of age; I reside at Jersey City, New Jersey; I am a dispatcher of locomotives, in the employ of the New Jersey Railroad and Transportation Company.

2. Q. Please state how long you have been in the employ of the said New Jersey Railroad and Transportation Company; in what capacity or capacities?

A. In the neighborhood of twenty-six or twenty-seven years. For the first seven years I was a machinist, working at journey work in their shop, from 1840 to 1849, except for about a year that I was absent during that time. From May, 1849, to September, 1861, I was master-mechanic of that road. From September, 1861, to the present time, I have been dispatcher.

3. Q. Please state, if you know, what kind of brakes were used on the New Jersey Railroad and Transportation Company's cars from the time you first went on the road up to 1850.

A. The single brake was the brake in use on the New Jersey Railroad until 1851.

4. Q. Are you able to state, of your own knowledge, whether there were any double-acting brakes used on the said New Jersey Railroad and Transportation Company's passenger or crate cars, for any length of time, from 1841 to 1851?

A. There were none, to my knowledge.

5. Q. Could there have been any double-acting brakes, operating the brakes on all eight wheels, from a windlass at either end of the car, on any of their cars during this time, for any length of time, and you not have known it? 898

A. No, sir; there could not.

6. Q. Are you acquainted with the construction and operation of the double-acting brakes now in use on the said New Jersey Railroad and Transportation Company's cars; and, if so, when did you first see such brake on a car?

A. I am. I first saw such a brake when M'r Baker put it on the cars in 1851—in the fall.

7. Q. When you saw the double-acting brake that M'r Baker put on a car in the fall of 1851, was it new to you at that time?

A. It was the first one that I ever saw in operation.

8. Q. Please describe that brake that Baker put on in 1851.

A. The brake is connected with a single lever under the centre of the car. It connects with a chain and rod; there is a rod that connects the brake from one truck to the other. It operates from a shaft that stands vertically on the platform, by a wheel or crank. The chain that connects to the vertical shaft hooks on the lever. It is connected so that you brake on both trucks from one end of the car or from either end.

9. Q. Has that same kind of brake been continued on the cars of that road up to the present time?

A. Yes, sir.

10. Q. Do you recollect of an experiment with what was called a double-acting brake being tried on the said New Jersey Railroad by one Isaac Newton Stanley or Joseph F. Talson about 1842; if so, what do you know about it?

A. My recollection of that brake is very little. I can't say that I know much about it, only there was a brake of some kind tried, but I never saw it in operation.

11. Q. Was this brake enquired about, of 1842, continued in use on that road?

A. No, sir; it was not.

12. Q. Please state what opportunities you had for knowing
899 what kind of brakes were used on said New Jersey Railroad and
Transportation Company's cars from 1841 to the time M'r Baker
put the double brake on in 1851.

A. The opportunities that I had were as follows: From 1841 to 1849, seeing the cars pass and repass daily, and often when they would run off the track to assist in putting them on. I often used to notice the difference between the New Jersey Railroad cars and the Camden and Amboy cars, in the construction of their trucks. When I was master mechanic I used to draw my attention to any improvements, and if I saw any I examined them closely.

13. Q. When you were first master mechanic on the said New Jersey Railroad, was it or was it not your custom to examine cars belonging to other roads for the purpose of seeing any improvements that might be on them?

(Objected to as leading.)

A. Yes, sir; I used to make it my business to examine cars of other roads to see any improvements there might be on them, as well to the running gears as to the inside of the cars.

14. Q. Did any of the Camden and Amboy Railroad Company's cars come into Jersey City between 1842 and 1851? If so, about how many daily?

A. They did. There were two trains; the number of cars to each train would average from seven to nine; sometimes there would be less, sometimes more.

15. Q. Did you have occasion to examine the Camden and Amboy cars that came into Jersey City between 1842 and 1851? If so, are you able to state what kind of brakes were used on such cars prior to 1851?

A. I have had occasion to examine the cars. The brake that was in use on the Camden and Amboy cars was the single brake.

16. Q. Did you ever see any double acting brake with a single cross-lever under the centre of the car on any of the Camden and Amboy cars that came to Jersey City prior to 1851?

A. No, sir; I did not.

900 17. Q. Could there have been such a double-acting brake used
on any of the Camden and Amboy cars which you examined,
that came into Jersey City between 1843 and 1851, and you not have
known it?

A. It could not have been used for any length of time without my knowing it.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Cross-q. Assume that twenty-eight witnesses, mostly from the Camden and Amboy road, have already testified in this case that one or more cars of said road had in use on the same a cross-lever double-acting brake from 1843 to 1851, are you prepared to swear in this court that such is not the fact?

A. Yes, sir; I swear as to those cars that came to Jersey City?

2. Cross-q. Do you know from personal inspection from day to day, month to month, of cars of the Camden and Amboy road from 1843 to 1851, that no car came over the New Jersey Railroad to Jersey City with a double-acting cross-lever brake on the car?

A. I did not inspect those cars from day to day.

3. Cross-q. Then may not, during days when you did not inspect said cars, a car or cars come over said New Jersey road with said double brake thereon?

A. There might have been a possibility, but not as a usual thing.

4. Cross-q. Do you know that no car on the Camden and Amboy road with a double-acting brake thereon never came over the road from 1843 to 1851?

A. No; I can't say positively that none ever came over; I only know that they were not in general use on the cars that came to Jersey City.

5. Cross-q. Then the substance of your evidence in this case is that you have not seen a car or cars of said Camden and Amboy road with said cross-lever double brake on it from 1843 to 1851?

901 A. Yes, sir.

6. Cross-q. Then you don't know positively what brakes were on all the cars of the Camden and Amboy road from 1842 to 1851.

A. I have no knowledge of the brakes that they used on the lower road; that is, in the lower part of the State.

7. Cross-q. Do you know James S. Gamble, Bernard Hughes, John H. Jobes, George Fielder, and Joseph F. Talson?

A. Yes, sir.

8. Cross-q. Do you believe these men to be credible witnesses in what they may be supposed to have personal knowledge of?

A. Yes, sir.

9. Cross-q. Assume that these men have testified that a cross-lever double-acting brake was put on a crate-car of the New Jersey Railroad Company in the fall of 1842, and used thereon indefinitely, may you not be mistaken, in view of your being a machinist, and not particularly connected with the cars, when you say that there was no such brake on a car of said road?

A. There was no brake used on that road to run regularly, according to my best recollection.

10. Cross-q. Do you or do you not swear positively that there was not, or is it merely from your best recollection?

A. I swear positively that there was no double-acting brake in general use during that time on any car.

11. Cross-q. What you know of the application of the Stanley and Talson brake, referred to by you in your direct examination, is from hearsay, is it, and not from personal knowledge?

A. I don't know much about it.

12. Cross-q. Then there may or may not have been such a brake put on a single car of that road without you knowing it?

A. Yes; there might have been; all I know is what I heard; I know they abandoned it.

902 13. Cross-q. Do you know that thereafter M'r Joseph F. Talson did put on a crate-car a double-acting cross-lever brake?

A. I don't recollect.

And being re-examined by M'r Sayles, the witness deposes and says:

1. Redirect q. Could any Camden and Amboy car with the double-acting cross-lever brake on it have run to Jersey City for any length of time between 1843 and 1851 without you knowing it?

A. No, sir; I don't think it could.

2. Redirect q. Could M'r Talson, or anybody else, have put the double-acting cross-lever brake on a crate-car, or any other car on the said New Jersey Railroad in 1842, and the same have run on that road for any length of time after you went back on the road in 1843, and you not have known it?

A. No, sir; it could not have been done.

3. Redirect q. Did you ever know any double-acting brake to have been used on any of the Camden and Amboy cars? If so, what kind of double-acting brake did you first see on their cars?

A. I saw the double brake with two cross-levers under the centre of the car.

4. Redirect q. About when did you first see the double brake with two cross levers on the Camden and Amboy cars?

A. It was after Baker put the double brake in operation. I can't say just what time. It was about the time the Hackensack bridge was burned, which was in September, 1851.

5. Redirect q. Was that the first double-acting brake you ever saw on any of the Camden and Amboy cars?

A. Yes, sir; the two cross-lever brake.

6. Redirect q. In the discharge of your duties as master mechanic on the said New Jersey road, were you led to examine the cars of that road sufficiently to enable you to know whether there were any double brakes used on any of the cars of that road for any length of time 903 between 1849 and the time M'r Baker put the double brake on a car in 1851?

A. Yes, sir. If there had been anything put on during the time I was master mechanic, I would have known it.

7. Redirect q. If there had been anything used during that time, would you have known it?

A. Yes, sir; I would have known it.

And being further cross-examined by M'r Whipple, he deposes and says:

1. Recross-q. Did you inspect all the cars of the Camden and Amboy road, from day to day, that came to Jersey City from 1843 to 1851, to see what brakes were in use on said Camden and Amboy cars?

A. No, sir; I did not.

2. Recross-q. Do you know from your own personal knowledge that no double acting brake was in use on any car of the Camden and Amboy road prior to the time of your seeing the two cross-lever brakes, as you say, on a car of said road?

A. None that ran to Jersey City, that I knew; there might have been on the other part of the road.

3. Recross-q. Do you know that no car of said Camden and Amboy

road ever came to Jersey City with a double-acting brake on it, from 1843 to 1851?

A. There was no car ran there regularly with it. I never saw one.

4. Recross-q. Do you know there never was a car came to that depot of the New Jersey Railroad with said double brake on said car?

A. I can't say positively whether there was or not. There is a possibility that one came there, but not as a general thing.

5. Recross-q. Then there might have one or more come without your knowing it?

A. There might have been.

904 6. Recross-q. Since you came into this office, has M'r Sayles, complainant in this case, shown you a model of the two cross-lever brakes and the centre-lever brake, or models or drawings of any of these or other brakes?

A. He showed me a drawing of a double-lever brake, of which I took no notice. I saw no models.

7. Recross-q. Did he present this to you in order to refresh your recollection with regard to his statement that no double-acting brake was in use on the Camden and Amboy road until this double-lever brake was applied?

A. I cannot say that he did.

8. Recross-q. Did he state to you that such was the fact?

A. I do not know that he did. He did not state anything of that kind to me.

9. Recross-q. Who first called your attention to the matter of testifying in this case?

A. M'r Sayles.

10. Recross-q. Did he state to you what he wanted you to testify to?

A. Nothing more than what knowledge I had of the brake, and when it was put in use.

11. Recross-q. Did he say anything to refresh your recollection?

A. Nothing. I considered about it and refreshed my own recollection about it.

12. Recross-q. Had you thought anything about this matter of brakes until your recollection was refreshed by M'r Sayles?

A. I don't know that I did. M'r Sayles did not refresh my recollection a bit about it; that is, from any information I got from him.

And being further re-examined by M'r Sayles, he deposes and says:

8. Redirect-q. Do you mean in your answer to the 5th recross-question to be understood that any car or cars of the Camden and Amboy road,
905 having the double-acting brake on, could have come into the Jersey City depot for any length of time and you not have known it?

A. No, sir; there could not, without my knowing it. My answer meant that as a general thing there could not without my knowing it.

And being further cross-examined by M'r Whipple, he deposes and says:

13. Recross-q. Could said Camden and Amboy cars, with said double-brake thereon, have come to Jersey City for a limited time, and you not know it?

A. If you limit it to one or two trips, it might be so. But as a general thing they could not come without my knowledge.

14. Recross-q. Then your attention through all these years, from 1842 to 1851, was particularly directed to brakes, was it?

A. Not altogether. No, sir.

15. Recross-q. Then you have special knowledge as to the brakes

in use on the cars of the Camden and Amboy road prior to 1851, have you?

A. As to the cars that ran on the line into Jersey City.

16. Recross-q. And all this special knowledge comes to you as a machinist, does it, and not as inspector of cars or repairer of cars?

A. It comes to me as a machinist, having a knowledge of the brakes that were used on the cars.

17. Recross-q. Was it not a little out of your line of duty as a machinist to be exceedingly familiar with brakes, as your evidence would seem to indicate?

A. No, sir. We used a brake on all our tenders, and they all came under my jurisdiction.

JAMES McFARLAND.

Subscribed and sworn to before me this 2d day of April, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

906 Examination adjourned to April 4th, 1868, at 11 a. m.

APRIL 4, 1868—11 a. m.

Present, counsel for both parties.

Examination further adjourned to April 7th, 1868, at 11 a. m.

NEW YORK, *April 7th*, 1868—11 a. m.

Present, M'r Sayles, complainant in person, and M'r Whipple, of counsel for defendant.

Examination further adjourned to April 8, 1868, at 11 a. m.

APRIL 8, 1868—11 a. m.

Present, M'r Sayles, complainant in person, and M'r Whipple, of counsel for defendant.

Examination further adjourned to 3 p. m. of same day, at chambers of district judge of the United States district court, in the city of New York.

Same day, 3 p. m.

At chambers of district judge of United States district court.

Present, M'r Cozzens, of counsel for complainant, and M'r Whipple, of counsel for defendant.

SAMUEL BLATCHFORD, judge of the district court of the United 907 States for the southern district of New York, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. Were you one of the counsel who tried on the part of the plaintiff at Albany, in October, 1854, the action at law of Henry Tanner vs. The New York and Erie Railroad Company upon the Tanner patent, so called, for improvements in railroad car brakes?

A. I was. I suppose you refer to the patent issued to Tanner, as assignee, on the invention of Batchelder and Thompson, July 6, 1852.

2. Q. Before whom was that case tried?

A. Before Judge Hall and a jury in the circuit court of the United States for the northern district of New York.

3. Q. Have you examined any notes of the testimony given at said trial; and, if so, please state by whom the notes so examined by you were taken, and in whose handwriting they are?

A. I took notes myself of the testimony of all the witnesses examined orally on the stand at the trial. I have such notes now before me and have recently examined them. They are in my own handwriting.

4. Q. Will you state whether it appears by said notes that Joseph F. Talson and Bernard Hughes were examined orally at said trial?

A. It does appear that both of them were so examined as witnesses on the part of the defendants.

5. Q. Will you state what was the testimony given by said Joseph F. Talson on said trial?

A. On his direct examination he testified as follows, as my notes of his testimony show:

"I reside at Bergen, Hudson County, N. J. For fourteen years before the last three years I resided in Jersey City. I was during that fourteen years superintendent of the car-department on the New Jersey Railroad and Transportation Company.

(Jersey model shown.)

908 "That model exhibits a double-action brake with lever in centre; each windlass acts on both brakes at the same time; brakes between wheels worked by cam on rock-shaft, never changed to outside of the wheels. The brake was put on like that New Jersey model. A double-acting brake was first put by Isaac Newton Stanley on the New Jersey Railroad. Stanley put one on in 1842. The brake he put on never went into use; it was so light and imperfect that it never answered the purpose. I threw all his gearing off and applied it mechanically like the Jersey model. I took his brake and strengthened the rods and connections. Stanley's differed from the Jersey model in the levers; he had three or four levers in the middle. When I put on the brake, I added one transverse lever the same as model. I operated the brake like this Jersey model. That brake ran on a car to Philadelphia or opposite to it; it ran two or three times—might have run more, might have run less than three times. This was Jersey model. I put this brake on in 1842; I am sure of this. Timothy L. Smith followed me in superintending that road. This brake was not put on any other car. Smith came on in 1844, and was opposed to this brake. Before that he was superintendent of motive power. Smith wanted to put in Griggs' brake, from Baltimore, to act by bumper. I can make a drawing of a car and build it. This Jersey brake would act on a curve. I never saw it in operation on a curve. This brake would not act so well on a curve as plaintiff's. The mode of forming the connection between the brakes of the two sets of trucks is substantially the same in the Jersey model as in plaintiff's brake. If you take out the arrangement of the Jersey model within the trucks, and put in Tanner's within the trucks, you will have Tanner's brake. M'r Boyce had charge of the company's books at the time the Jersey model brake was made. I reported to Boyce what charges to make."

On his cross-examination he testified as follows:

909 "Stanley's brake broke the first time it was tried. It was put together with rods, they came apart and we tied them with strings. I last saw Stanley two and a half or three years after this brake was applied. He said he had given up his brake and was not going on with it. From September, 1842, till January, 1843, we had no superintendent. After the brake ran a week it was changed to a single foot brake. I left the road in the last of August, 1849. Smith left in June or July, 1849. From the time I altered this to a single-foot brake there were no double-acting brakes on the cars till I left the road that were acted on by a windlass at either end. There were double-acting

brakes on the tenders, but they were not operated on by a windlass at either end. The self-acting brake of Griggs was never put on. Within the trucks the Jersey brake was different from Tanner's."

On redirect examination he testified as follows:

"The brakes on the tenders could not be operated from both ends. The brakes on the tenders did not have the intermediate lever, and only a single connecting rod.

"Stanley's two experiments cost between two hundred and three hundred dollars. One failed; the other ran to Jersey City. The brake I made was paid for by the company."

Subsequently, on the trial, M'r Talson was recalled as a witness and testified as follows:

"After the trial of this brake we continued to use the single-acting brakes on all the cars."

6. Q. Will you state what was the testimony given by said Bernard Hughes on said trial?

A. On his direct examination he testified as follows, as my notes show:

"I resided in Jersey City in 1841-'2; I worked under Talson on
910 New Jersey Railroad. I recollect about brake in Jersey model,
put on in 1842. I cannot say how long after. I have examined the Jersey model; this is like the brake. There may have been two levers at the centre. I remember the brake being put on one of the cars. I don't know that it ran afterwards. I know it was tried, because I helped push it myself by hand; I speak of the one Stanley put on. Stanley was a shoemaker. I know of Talson putting on a brake like the Jersey model. That was applied to a passenger car. That car was used. I think it made three trips to Camden with this upon it; it operated. The construction of it was not satisfactory to keep it on the road to place any reliance upon it. I can't recollect for why. My business was to watch the cars."

7. Q. Will you please state which one of the several defences of the defendants in that action was regarded by the plaintiff's counsel as most important.

A. My recollection is that the only brake put in evidence on the question of novelty, which the plaintiff's counsel regarded as amounting to anything in the evidence, was a brake said to have been invented by a M'r Willard I. Nichols, and put on a car on the New Haven, Hartford and Springfield Railroad, in the spring of 1847; the principal witness as to which was a man by the name of Lepennes, M'r Nichols, I think, being dead at the time of the trial. Among these notes are notes of the testimony of M'r Lepennes and of M'r's Nichols, the wife of M'r Nichols. They were both examined orally at the trial.

And being cross-examined by M'r Whipple, of counsel for the defendant, the witness deposes and says as follows:

1. Cross-q. What, if any, was the result of that trial?

A. There was a verdict for the plaintiff.

2. Cross-q. What was the amount of that verdict?

A. I do not now remember.

3. Cross-q. Was it not the verdict of the jury that the Hodge brake and the Stevens brake were infringements of the said Batchelder and Thompson or Tanner centre lever-brake patent?

911 A. It was; as I recollect.

4 Cross-q. Was it not rather by stipulation of counsel afterwards than by verdict of the jury that the Hodge and Stevens brakes were declared infringements of the said Tanner patent?

A. Not that I recollect. My recollection is that the jury came into court with a verdict for the plaintiff generally, for so many dollars damages; the amount I now see from a certified copy of the verdict was $75. My recollection is quite clear that when the jury rendered that general verdict, counsel for the plaintiff suggested to the court that it was proper in their judgment for the jury to indicate which of the alleged infringing brakes, one or both, they found to be infringements; and that the jury stated that they found both the Hodge and Stevens brakes to be infringements; and that the court then and there, before the discharge of the jury, directed a statement to that effect to be incorporated in the verdict, which was done.

SAMUEL BLATCHFORD.

Subscribed and sworn to before me this 8th day of April, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to April 10th, 1868, at 11 a. m.

NEW YORK, *April* 10, 1868—11 a. m.

Present, M'r Sayles, complainant, in person, and M'r Whipple, of counsel for defendant.

WILLIAM QUIGLEY, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

912 A. My name is William Quigley; I am forty-three years old; I reside at Philadelphia, in the State of Pennsylvania; I am a locomotive engineer.

2. Q. Have you ever been employed on the Camden and Amboy Railroad; if so, for how long a time, and in what capacity or capacities?

A. I have been employed on that road from 1843 to the present time, and am so now. In the beginning I was brakeman; I then worked as fireman, and then I went back to braking again for a while, then I went to firing again for a while, and then ran on the road as engineer. I am still engineer on the road.

3. Q. Do you, or do you not, recollect the circumstance of President Tyler taking a trip through New Jersey, in June, 1843?

A. I do.

4. Q. Were you employed on the Camden and Amboy road at that time?

A. I was.

5. Q. Do you recollect of a car being got up on the Camden and Amboy road to convey President Tyler over that road at that time?

A. I do.

6. Q. Please describe the car generally?

A. The car was rebuilt and got up on very stylish plans for that purpose; it had looking-glasses in both ends; a saloon on one end, a privy, I mean; it was on the platform; the seats were of different patterns; the car was painted a very light color; it was a very nice car; it had six-wheel trucks under it, and elliptic and spiral springs under it.

7. Q. Please state, if you know, what kind of brakes were put on that car at the time it was rebuilt in 1843.

A. They were brakes on each end of the car applied separately to each truck.

8. Q. Please state, if you know, how long such brake as you have described was continued in use on the Tyler car.

A. It was continued there until 1851, or thereabouts.

913 9. Q. You say this brake was continued till 1851. What brake, if any, was used on the car after about 1851?

A. After 1851 there was used a double brake.

10. Q. Please describe the double brake that was put on in 1851.

A. It was a single lever-brake, connected with a lever in the centre of the car to the body of the car.

11. Q. Do you recollect of a double brake being used on the New Jersey Railroad and Transportation Company's cars; if so, when did you first see it?

A. I do. I first saw it in 1851.

12. Q. Was that brake the same or different from the double brake you say was put on the Tyler car at about that time?

A. They were both the same.

13. Q. Did you know of any double brakes with two cross-levers under the bodies of the cars put on any of the Camden and Amboy cars about that time?

A. There was a double-lever brake used there just before the time the one was put on the New Jersey Railroad.

14. Q. Please state when you first recollect of seeing a brake used on a car called a double-acting brake, or that operated the brake on both trucks from either end of the car.

A. It was in 1851.

15. Q. Do you recollect what car you first saw such double brake on?

A. The first car that I saw that double brake on was a car called the Tyler car.

16. Q. Do you recollect ever seeing the Tyler car with a brake on with two cross-levers under the body of the car?

A. I do.

17. Q. Please state as nearly as you can when you first saw such two-lever brakes on the Tyler car.

A. That was put on in the same year, in 1851.

18. Q. Was it before or after you first saw the centre single-lever brake?

A. It was before.

914 19. Q. Do you mean to be understood that the said Tyler car had the two cross lever double brake on it first, and afterwards had the single cross-lever double-acting brake on?

(Objected to as instructing the witness.)

A. I do.

20. Q. What kind of brakes, if you know, were used on the passenger and crate or baggage cars of the Camden and Amboy road from 1843 to 1851?

A. A single brake, applied on one truck at a time.

21. Q. During the time from 1843 to 1851, if there had been any double-acting brakes operating on the wheels of both trucks from either end of the car, on any of the passenger or crate cars of the Camden and Amboy road, would you have known it?

A. I would.

22. Q. What was your business in the spring of 1843, when the Tyler car was rebuilt?

A. Brakeman.

23. Q. Did you or did you not have occasion to examine the Tyler car

particularly at the time it was rebuilt; and, if so, what caused you to examine it?

A. I did; it was the first car that had a six-wheel truck under it; it was one of the nicest fitted-up cars at that time on the road. I had occasion to oil it at different times, and my mechanical ideas were so great that I took particular pains to examine the car and see what improvements they had put on it.

24. Q. Do you recollect particularly about the brakes that were put on at the time it was rebuilt in 1843?

A. I do, sir.

25. Q. Do you distinctly recollect of noticing the brakes on the Tyler car at different times between 1843 and the time you first saw the double brake on with two cross-levers under the body of the car in 1851?

915 A. I distinctly recollect the brakes from the time the car was rebuilt in 1843 to the time when the double brake was put on it in 1851.

26. Q. About what time did you commence running as engineer on that road?

A. In 1852.

27. Q. What kind of brakes were used on the passenger and crate cars when you first commenced running as engineer?

A. Some were double brakes and some were single.

28. Q. What kind of double brakes were on the passenger-cars at that time?

A. There was the single-lever brake in 1852, applied on both trucks at the same time.

29. Q. What portions of the Camden and Amboy Railroad were you on from 1843 to 1851?

A. I was on the whole, from Camden to Amboy, on some trains; from Bristol to New Brunswick, and from Tacony to New Brunswick on others.

30. Q. About how many of the New Jersey Railroad and Transportation Company's cars did you have occasion to see from 1843 to 1851 daily?

A. From about ten to eleven cars, as a general thing two trains.

31. Q. Were these New Jersey cars you speak of in the trains that you were on between Jersey City and Philadelphia?

A. They were.

32. Q. Could the double-acting brake have been used on any of these cars that were in the trains you were on for any length of time, and you not have known it?

A. No, sir.

33. Q. Were you either brakeman, fireman, or engineer on said Camden and Amboy road during all this time, between 1843 and the present time?

A. I was brakeman, fireman, or engineer during the whole of that time.

34. Q. At the time the double brakes were first put on the Camden and Amboy road and the New Jersey Railroad and Transportation Company's road, as you say, in 1851, was there much talk about the double brakes? If so, what was said, and by whom? 916

A. There was, by the brakemen and engineers. They said that they could stop and hold the train at so much shorter a distance than could be done with the single brake. One brakeman on those would hold as much as two on the single brakes.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Cross-q. You say you were first brakeman, in the employ of the Camden and Amboy Railroad, in 1843; brakeman on what kind of a train, and between what points did said train run ?

A. On passenger trains between Camden and Amboy, and between Tacony and Jersey City.

2. Cross-q. This was the in the year 1843, was it ?

A. Yes, sir.

3. Cross-q. Did you ever run as brakeman on freight trains during that year ?

A. No, sir.

4. Cross-q. Who was conductor of the passenger-train in that year, of which you ran as brakeman, and who was engineer ?

A. Isaac Van Doren was conductor, Wilson Brown and Edward Wilsey were engineers.

5. Cross-q. You say you were thereafter fireman. On what trains, who was conductor, who engineer, and who brakeman, and from what point to what point did said trains run ?

A. On the trains from Camden to Amboy and back, passenger-trains. I know the name of the conductor quite well, but cannot just now think of it. I now recollect it. It was Andrew Forbes. Charles Yundt was the engineer, also William Matthews. John Barney was brakeman.

6. Cross-q. Were these wholly passenger trains, or what are called mixed trains, passenger and freight, and in what year did they run in which you were fireman ?

917 A. They were passenger trains. It was in 1844 and 1845. I was not on those trains all that time.

7. Cross-q. You then say you went back to the brake again, in what year ?

A. In 1847.

8. Cross-q. While fireman, did you know of excursion trains being run on the Camden and Amboy road ? If so, in what years did they run ?

A. I did. They ran while I was firing and before I commenced firing. They ran in 1844 and 1845, while I was firing.

9. Cross-q. Do you know Charles Yundt ?

A. I do.

10. Cross-q. When he swears in this case that there was a double brake on a car of said Camden and Amboy road run in one of said excursion trains in the year 1845, such a double brake as you say was put upon that road in 1851, does he swear falsely or truly ?

A. That is not for me to say whether he swears falsely or truly.

11. Cross-q. Assume that he has thus sworn, has he testified the truth ?

A. It is not my place to answer whether he has sworn to a lie or the truth.

12. Cross-q. Do you regard Charles Yundt a creditable witness in a matter of which he may be supposed to have a personal knowledge ?

A. Not knowing, I cannot say.

13. Cross-q. Do you know Edwin Lockwood ?

A. I do, sir.

14. Cross-q. Do you regard him a creditable witness in any matter of which he may be supposed to have a personal knowledge ?

A. Not knowing, I cannot say.

15. Cross-q. Do you think he would be likely to know what brakes

were put upon the car which conveyed John Tyler over the road in 1843?

A. I don't know.

918 16. Cross q. What was his position then and what is it now on the Camden and Amboy road?

A. He was boss of the wood-work shop; he is the same yet.

17. Cross-q. In view of such position, would he or not be likely to know what brakes were put upon the Tyler car in 1843?

A. I do not know.

18. Cross q. Whose advantages, in your estimation, were best, yours or his, in relation to what was put upon the cars of said road from time to time?

A. I do not know what advantage it was to him at all.

19. Cross-q. Do you know Joseph Head?

A. I do.

20. Cross-q. What was his position on that road in 1845?

A. Station agent.

21. Cross-q. Do you think he would be likely to know what brakes were on the Tyler car in 1845 as well as you?

A. I don't know.

22. Cross-q. Do you know Letchworth Cox?

A. I do.

23. Cross-q. What was his position on that road in 1843, 1844, and 1845?

A. He worked in the car shop.

24. Cross-q. Do you think he would be likely to know what kind of brakes were on the Tyler car during that time?

A. I don't know.

25. Cross-q. Have your advantages been superior to all other men on that road, from 1843 to 1851, in relation to the brakes on certain cars of that road?

A. I don't know.

26. Cross-q. Have they been sufficient to warrant you in standing up in this court and contradicting the testimony of twenty-eight witnesses, mostly from the Camden and Amboy road, who have testified in this case that one or more double brakes, such as you have described, were in use on one or more cars of said road from 1843 to 1852?

919 A. I say no further than I know myself. I know nothing about the other witnesses. As to saying anything against those men, I have nothing to do with it.

27. Cross-q. You say that a single brake was used on the Tyler car from 1843 to 1851, and when you are asked to describe the double brake used thereafter you say it was a single lever brake, connected with a lever in the centre of the car to the body of the car. Was this the first double brake you ever saw?

A. No, sir.

28. Cross-q. If this is not the first, please describe the one you did first see. On what car and where?

A. The first double brake I ever saw was the Hodge brake, a double lever brake. That brake was put on the Tyler car in the first place; about the date I cannot be positive. In 1851 that brake was put on, in the spring.

29. Cross q. Was the Hodge brake taken off from the Tyler car in 1851, and some other double brake put on?

A. I would not be positive in 1851; it may have been a later date than that. Just before the Burlington accident the McLaughlin brake was put on; it worked from the bumpers of the car. At that time they disconnected the double lever brake, making a single lever brake of it.

30. Cross-q. After answering the 13th direct interrogatory did you have occasion to leave the witness stand and go into room adjoining? If so, for what purpose?

A. I did. I went in there to wash the blood off from my nose; I had bleeding at the nose.

31. Cross-q. Did M'r Sayles, the complainant in this case, follow you into that room?

A. He walked into that room and turned the water on for me.

32. Cross-q. While so doing did he whisper to you?

A. No, sir.

33. Cross-q. Did he or did he not say that the Hodge brake was put on the Tyler car before the centre lever brake, or words that conveyed this idea?

A. He did not to me.

34. Cross-q. You are quite sure, are you, that the Hodge brake was put on the Tyler car in 1851?

920 - - A. I am.

35. Cross-q. You think there is no chance of your being mistaken, do you?

A. I say that I am certain that the Hodge brake was put on the Tyler car about the spring of 1851?

36. Cross q. And you are just as sure, are you, that thereafter a single centre lever was put on the Tyler car?

A. I am just as sure that it was, after the McLaughlin brake was put upon the car that worked from the bumpers, then a single lever brake was connected to it.

37. Cross-q. Then the McLaughlin brake was put upon the Tyler car, was it?

A. I say the McLaughlin brake was put on the cars; I did not say on the Tyler car.

38. Cross-q. Was the McLaughlin brake put on the Tyler car?

A. I don't think the McLaughlin brake was put on the Tyler car; I am satisfied that it was not on the Tyler car.

39. Cross-q. Was it necessary to change the Hodge brake to the centre lever brake, in order to apply the McLaughlin brake?

A. It was.

40. Cross-q. Was the change made in the Tyler car from the Hodge to the centre lever brake, as you say, that the McLaughin brake might be applied?

A. I did not say that it was.

41. Cross q. You said it was changed from the Hodge to the centre lever brake, did you not?

A. I did not say that it was on the Tyler car. I said the Hodge brake was on the Tyler car, but I did not say it was changed to the centre lever brake.

Cross q. 42. Was the Hodge brake ever taken off from the Tyler car? If so, what brake was put on in its place?

A. It was taken off the Tyler car. A single lever brake was put on the Tyler car some time afterwards.

43. Cross-q. How long afterwards?

A. I could not be right positive as to the length of time; some year or two.

921 44. Cross q. To what extent was the Hodge brake applied to the

cars of the Camden and Amboy road? Were they in general use or not?

A. I have known them to be on five, six, or seven cars myself; they might have been on more for aught that I know.

45. Cross-q. Then they never went into general use on that road?

A. What do you call general use? There was quite a number had them on.

46. Cross-q. Is the Hodge brake in use on that road now?

A. Nowhere on that road that I know of; not on the main line of the road.

47. Cross-q. You said there could not have been a double acting brake on the cars of said road without your knowing it. Did you take particular pains, through all these years, to inspect the cars with reference to the brakes that might be on them?

A. I did in regard to all that there was any improvement put on. I have gone so far as to take the drawings of the brakes that were put on at the time, and I have those drawings at home now.

48. Cross-q. Will you produce these drawings and annex them to your deposition?

A. I don't know that I am compelled to produce a drawing of anything I have made a drawing of.

49. Cross-q. Will you produce copies of these drawings?

A. I could do it if it should become necessary that I should do it.

50. Cross-q. Will you do so by defendant's counsel paying the expense of making copies?

A. I did not come here to be paid for telling what I know; I came here to tell the truth, and all I do, I do without being paid for.

51. Cross-q. Will you produce the copies of said drawings without pay?

A. Not unless I am compelled to produce them.

922 52. Cross-q. What trains do you run on as engineer on the Camden and Amboy road, at the present time?

A. Some days the Cincinnati express, some days the accommodation, some days the Washington through line, sometimes, nights, the Adams Express.

53. Cross-q. Do you know David T. Jeffries?

A. I do, sir.

54. Cross-q. Is he conductor on any of the trains run by you as engineer; if so, what trains?

A. He is at different times, on the Adams Express from New York, Adams Express from Philadelphia back. He is conductor on the train as conductor regularly. I do not run that train regularly, but only a week at a time.

55. Cross-q. Are you employed wholly by the Camden and Amboy road?

A. I am.

56. Cross-q. And do you receive pay wholly from that company?

A. If I did not I should not work for them for nothing.

57. Cross-q. Do you receive any pay from the Adams Express Company?

A. I do not suppose that you would want to pay me if I did not work for you. I never worked a day for the Adams Express Company, and I certainly should receive no pay for what I did not work for.

58. Cross-q. Who first called your attention to testifying in this case?

A. I was subpœnaed to do so.

59. Cross-q. By whom?

A. By the prosecutor.

60. Cross-q. Who is the prosecutor?

A. This gentleman who sits here at the corner of the table; I do not remember his name.

61. Cross-q. Did M'r Sayles, who sits at the corner of this table, serve the subpœna upon you; if not, who did it?

A. He sent it to me by mail.

62. Cross-q. Have you had conversation with regard to your evidence in this case with any person or persons before you came into this room?

923 A. Nothing further than on the road among our own men about the different brakes, how they worked, &c., &c.

63. Cross-q. Have you had any conversation with David T. Jeffries in relation to your evidence in this case?

A. No, sir.

64. Cross-q. Have you with M'r Sayles, complainant in this case?

A. No, sir.

65. Cross-q. With whom have you had conversation? Name the party or parties.

A. With no one about this case.

66. Cross-q. Have you had any conversation with any party or parties in relation to brakes, lately?

A. No, sir.

And being re-examined by M'r Sayles, he deposes and says:

1. Redirect q. In your answer to the last cross-question do you mean that you have had no conversation about brakes lately, previous to today?

A. Not with any parties concerned in this suit. Nothing further than with our own employees on the road. I have had talk with our own men about brakes, about how they held and how they did not—not in regard to being pried into to know what I knew or anything of that kind. I have never previous to to-day had conversation with anybody, except our own men about brakes. I have had to-day.

2. Redirect q. Was the said Tyler car run in the trains that you were on, often between 1843 and when it first came out and 1851?

A. It was.

3. Redirect q. In the 17th direct question you are asked to state as nearly as you can when you first saw such two-lever brake on the Tyler car. Your answer is, "That was put on in the same year, in 1851." Do you mean to be understood that the centre-lever double-acting brake was put on the Tyler car in 1851, or do you mean that it was

924 after the McLaughlin brake was put on the Camden and Amboy cars? Please explain.

A. The Hodge brake was put on in the spring of 1851, somewhere thereabouts, and then some time after that—I can't say how long the McLaughlin brake was put on. Then they put the single centre brake on after the McLaughlin brake. The McLaughlin brake used to jam, and we could not get it released from the wheels. They connected that single-lever brake to that McLaughlin brake and tried to make it work. They likewise put a spring under the car to try to make that McLaughlin brake free itself. They then dispensed with all the McLaughlin brakes and left on the single-lever brake. We frequently had to go under the cars and free that McLaughlin brake by prying it off of the wheels.

4. Redirect q. How sure are you that you did not see the single centre-lever double-acting brake on the Tyler car or any other cars belonging

to the Camden and Amboy Company before they commenced putting the McLaughlin brake on their cars?

A. I am sure I did not.

5. Redirect q. In your answer to the 41st cross-question you say, "I did not say that it was on the Tyler car." What do you mean by "it was not on the Tyler car"?

A. I mean the McLaughlin brake was not on the Tyler car.

6. Redirect q. You also say in answer to the 41st cross-question, "I said the Hodge brake was on the Tyler car, but I did not say that it was changed to the centre-lever brake." Did you mean that the Hodge brake was not changed on the Tyler car and the centre-lever brake put on in its place? Please explain.

A. I meant to say that it was not changed to the McLaughlin brake. It was changed from the Hodge brake to the centre-lever brake.

7. Redirect q. In your answer to the 3d redirect question you say "the McLaughlin brake was put on." What did you mean it was put on?

925 A. On the cars. It was put on a flat car in the first place.

And being further cross examined by M'r Whipple, he deposes and says:

1. Recross-q. Do you wish to be understood that you knew nothing of what you were expected to testify to in this case until you came into this room to give your evidence?

A. I knew before I started that I came here to testify about these brakes.

2. Recross q. Did you know what you were to testify to?

A. I was to testify to what I knew about those brakes on those cars.

3. Recross-q. Who notified you to testify to what you knew about those brakes on those cars?

A. Knowing that that was what I was subpœnaed for to come here.

4. Recross-q. Have you the subpœna with you?

A. No, sir.

5. Recross-q. Where is it?

A. The last I saw of it it lay in the tool-chest in the locomotive.

6. Recross-q. Then you had no knowledge before coming here of what you were to testify to, except that it was about brakes?

A. These double-acting brakes.

WILLIAM QUIGLEY.

Subscribed and sworn to before me this 10th day of April, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to April 11th, at 10 a. m.

926 APRIL 11TH, 1868—10 a. m.

Present, M'r Sayles, complainant, in person, and M'r Whipple, of counse for defendant.

Examination further adjourned to same day, at 2 p. m.

2 P. M. SAME DAY.

Present, M'r Sayles and M'r Whipple, as before.

Examination further adjourned to 13th April, 1868, at 1 p. m.

NEW YORK, *April 13th*, 1868—1 p. m.

Examination further adjourned to April 14th, 1868, at 11 a. m.

NEW YORK, *April 14th*, 1868—11 a. m.

Present, M'r Whipple, of counsel for defendant.

Examination further adjourned to April 15th, 1868, at 11 a. m.

APRIL 15TH, 1868—11 a. m.

Present, M'r Sayles, complainant, in person, and M'r Cozzens, of counsel for plaintiff, and M'r Whipple, of counsel for defendant.

927 CHARLES M. KELLER, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A My name is Charles M. Keller; my age is 57 years; I reside in the city of New York, and am a lawyer.

2. Q. Are you acquainted with Thomas Sayles, the complainant in this case, and have you for some time past acted as counsel for him at different times in relation to the so-called Tanner patent for an improved car-brake? If so, for about how long a time have you been his counsel in such matter?

A. I have been acquainted with M'r Sayles certainly since as early as 1852, and have acted as counsel for him in suits under the Tanner patent for a double-acting car-brake—at first about 1852, when suits were brought in the name of Tanner, Sayles being interested with Tanner, and subsequently when suits were in his name.

3. Q. Do you remember an action at law brought on the said patent by said Henry Tanner against the New York and Erie Railroad Company, and tried before Judge Hall and a jury, at Albany, in 1854; and were you engaged in that action as senior counsel on the part of the plaintiff?

A. I remember that suit, and was engaged as senior counsel in it. I examined the witnesses and summed up the case when tried in Albany at the October term of 1854. The present judge of the district court, Judge Blatchford, was associated with me at that time as counsel in the case.

4. Q. Will you please state anything which may be within your knowledge respecting any investigations made prior to that trial on the part of the plaintiff in that suit in regard to the alleged defences set up by the notices of special matter served in the case?

A. There were several matters which were investigated called up by the notices of special matter. One was an alleged prior invention by Nichols, in Connecticut, and the other was a brake alleged to have been previously used on the New Jersey Railroad and Transportation
928 Company's cars, alleged to have been invented by a man of the name of Stanley.

5. Q. Did you before said trial see and converse with a man by the name of Joseph F. Talson in reference to one of the defences set up in said notices; and, if so, what defence was such conversation about, and what did said Talson say about it?

A. Either M'r Sayles or M'r Tanner, or both, informed me that Talson had full knowledge of every kind of brake that had been used on the New Jersey Railroad and Transportation Company's road. He was brought to me, and I had full and careful conversations with him in reference to the kinds of brakes that had been used on the cars of that railroad company during the whole period of time that he was the superintendent of cars for that company at Jersey City. I asked him, particularly, in reference to the alleged prior invention of Stanley, and on that subject examined him very carefully, as I am in the habit of doing, with the view of ascertaining whether his testimony would be material to the plaintiff in establishing that that alleged prior Stanley invention would or would not invalidate the Tanner patent; and after a careful consideration of his statement of his knowledge upon that subject, I advised my clients that, in my belief, that defence would fail to impeach the validity of the Tanner patent.

6. Q. Will you state, to the best of your recollection, what said Talson said to you about the Stanley brake in these conversations?

A. In substance, his statement was that a double-acting brake was applied on one of the cars at Jersey City by Stanley, somewhere, if I remember right, in the year 1842 or 1843, whilst he was superintendent of cars on that road; that it broke the first or second time that it was tried, and it was tried twice or three times, and it was so defective that he himself took it off and changed it back to a single-acting foot-brake; and that some two or three years afterwards he met Stanley, who told him that he had abandoned the prosecution of that brake; that
929 during the whole time that he was superintendent of cars on that
road there were no double-acting brakes on any of the cars except this one trial by Stanley; that there were some double-acting brakes on the tenders, but that they could not be operated by the windlass at either end of the car, and could only be operated from one end; and that he was thoroughly acquainted with every kind of brake used on the cars of that road up to the time he ceased to be superintendent, some time in the year 1849.

7. Q. State whether, in any of these conversations, Talson said anything to you about whether that Stanley brake was the only double brake, operated from both ends of the car, that he knew of up to 1849; and, if so, what did he say?

(Question objected to.)

A. In those conversations he not only told me that the Stanley experiment was the only double-acting brake that could be operated from both ends of the car that was on any of the cars of that road up to the time he left in 1849, but so testified on the trial in Albany. He stated in these conversations that it was the only brake operated from both ends of the car which, to his knowledge, had been on any of the cars of that road up to the time he left in 1849, and that it was the only double-acting brake operated from both ends of the car of which he had any knowledge up to the time of his leaving in 1849.

8. Q. Did he at any time before, or during, or after said trial, say anything to you or intimate in any way anything about the use on a car called the Tyler car, belonging to the Camden and Amboy Railroad Company, or upon any car or cars belonging to said Camden and Amboy Company, of a double-acting brake operating from both ends of the car?

A. In our conversations I have no recollection that any car called the Tyler car was ever mentioned, and he never said to me at any time that he had any knowledge of any double-acting brake operated from
930 both ends of the car, on any car of the Camden and Amboy Rail-
road Company.

9. Q. You have said that Talson testified at the trial which has been mentioned. Can you state the substance of the testimony which he gave there?

A. The substance of his testimony at the trial of Tanner vs. The Erie Railroad Company, at Albany, in 1854, corresponds with my statement of his conversations with me as given by me in my answers to the 6th and 7th questions.

10. Q. Talson has testified in this present suit that in his testimony at the trial in Albany he stated that he had no recollection of the brake put upon the New Jersey Railroad car ever being taken off, and that he would have gone into more of an explanation at Albany, but he was stopped by the counsel for M'r Sayles; and he has also testified in this suit that when at the Albany trial he "would begin to advance anything in explanation of the model he made" (of the New Jersey Railroad brake) "the counsel on M'r Sayles' side would say to him that he didn't want him to talk about that, he wanted him to talk about some other part of the model," and he has also testified that you were the counsel who told him that you did not want him to explain the Jersey brake. Are these statements of Talson's, or any of them, true?

A. They are not true.

11. Q. Did he at said trial testify anything whatever about having no recollection of the Stanley brake ever having been taken off?

A. He testified distinctly at the trial that he took off the Stanley gear and made the brake a single-acting foot-brake.

12. Q. Did he in any conversation with you at any time before or during or after said trial, say or intimate any such thing?

A. No.

13. Q. Talson has also testified in the present suit that the counsel for the railroad company, at the Albany trial, "did not sustain him," in
the matter of his examination. Will you state what you may know
931 of your own knowledge respecting whether the Erie Railroad Company and their counsel in that suit opposed the plaintiff zealously or not?

A. I thought at the time, and have always remained of the same impression since, that the counsel for the Erie Railroad defended that suit with all their ability. A suit had been simultaneously or about the same time commenced against the Hudson River Railroad. The solicitor for the Erie Railroad entered into an agreement to abide by the result of the suit against the Hudson River Railroad. The solicitor of the Hudson River Railroad Company, after investigating the matter, came to me and informed me that after ample consideration counsel had come to the conclusion that they had no defence in that matter, and paid me the costs of the suit and the amount charged for a license. I communicated that result to the attorney of the Erie Railroad and demanded a settlement on the part of that railroad, in compliance with my understanding of the terms of the agreement. He declined to settle, contending that the agreement merely bound the road to settle after the result of a trial of the case against the Hudson River Railroad, and as there had been no trial in that case, the Erie Railroad Company would defend. At the June term of the circuit court for the northern district of New York, they obtained a continuance to the following October term at Albany, on the ground that there was a strike on the Erie Railroad which would prevent them from producing their witnesses in time; notwithstanding, on the first day of the term, on the calling of the calendar, they had answered ready for trial, and the cause had been set down for trial for the following week. The notice of special matter in the case indicated zeal in the preparation of the cause on the part of the defence and I was then, and have been ever since, under the belief that the case was defended with zeal.

14. Q. Did they have to pay any costs for the continuance from the

June term to the October term? And, if so, about how large a sum, if you remember?

932 A. They had stipulated with me to be ready for trial at the June term. On the call of the calendar they answered that they were ready, and in conformity with the wishes of both parties the court set down the case for trial for the following week, and when, afterwards, they asked for a continuance, for the reasons previously stated the court refused on the ground that by their stipulation and agreement they were bound, and that he could not relieve them. They then stated that, under the circumstances, unless I would consent they would have to let the case go by default, as it was impossible for them to have their witnesses in time. I finally consented to a continuance to the October term if they would pay the expenses that my clients had been put to in making preparation and bringing their counsel and witnesses twice to Canandaigua, in accordance with the stipulation, and they paid between $1,300 and $1,400, the clerk of the court having been assigned by court to state the account of the expenses, according to the consent.

15. Q. Was there any collusion whatever, between the plaintiff and the defendants in that suit?

A. None whatever, that ever came to my knowledge, or ever excited my suspicion.

16. Q. Was the suit fairly and fully tried, so far as you know, on both sides?

A. I believe it was.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Cross-q. Are you at the present time counsel for complainant in this case?

A. I am not.

2. Cross-q. Are you retained as counsel by any party or parties interested in the extended term of the said Tanner centre lever brake patent?

A. I am.

3. Cross-q. By whom?

933 A. I received a retainer from M'r Mowry, who, as I was informed, is the trustee of the owners of the extended term of the patent.

CHA'S M. KELLER.

Subscribed and sworn to before me this 15th day of April, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

THOMAS SAYLES, complainant, being recalled as a witness on his own behalf, and having been duly cautioned and sworn, deposes and says, as follows:

1. Q. Will you please state whether there was in any respect, whatever, any collusion before or during the trial between the plaintiff and the defendants in the trial between Tanner and the New York and Erie Railroad Company at Albany, in 1854, or was there any material fact to your knowledge, kept back on either side at that trial?

A. There was not any collusion between the plaintiff and defendants in that case to my knowledge. I was really the plaintiff in the case myself, having purchased the patent previous to that trial, and took the chances of the trial myself. There was no material fact kept back on either side to my knowledge.

2. Q. Talson, in his cross-examination in this case, has stated as follows: "I testified at Albany under peculiar circumstances. M'r Sayles came to me before the trial came on and said to me, 'M'r Talson, I know that you hold in your hand sufficient evidence to seriously injure my patent or to kill it, but if you will not advance anything on this trial, and I win the suit, I will make you a very handsome present.'" Is that statement true in any particular?

A. It is not.

And being cross-examined by M'r Whipple, he deposes and says as follows:

934 1. Cross-q. You were plaintiff in the case alluded to in the first question in your present recall, were you?

A. I was not plaintiff in bringing the suit, but after the suit was brought I purchased the patent of Tanner, and was to try the suit at my own expense, and take the chances of the result.

2. Cross-q. You were an interested party, were you?

A. I was interested.

3. Cross-q. To what extent?

A. I was the owner of the patent, except for some two or three States, I think.

4. Cross-q. Are you interested in any way, directly or indirectly, in the extended term of the so-called Tanner patent, of which you own, as you say, the first term of said patent?

A. I don't know whether I am or not.

5. Cross-q. Do you expect to be in any way, directly or indirectly, interested in said extended term, consequent upon any circumstance or circumstances that have arisen or may hereafter arise?

A. I cannot tell what may arise, or whether I shall ever be interested in it or not.

6. Cross-q. Question repeated, and a responsive answer required.

A. I cannot tell what circumstances may arise, and I do not know, neither can I tell, what may transpire hereafter with regard to the extended term of the patent.

7. Cross-q. Have you any agreement, verbal or otherwise, with any party or parties interested in said extended term, as counsel or otherwise, that you shall have an interest in said extended term?

A. No such agreement exists.

8. Cross-q. Neither tacitly or implied?

A. I have no agreement with any one connected with the extension for any interest therein.

9. Cross-q. Directly or indirectly?

A. Nothing definitely.

10. Cross-q. Then you do expect an interest, do you?

A. I hope I may have an interest.

935 11. Cross-q. Do you expect an interest?

A. I hardly know whether I do or not.

12. Cross-q. Does any party or parties, whether of counsel or otherwise, connected with the extended term party, pay or agree to pay any expenses connected with the trial of this case, in which you are complainant?

A. I don't know that they have paid any. There has been some talk about their paying something, that is all.

13. Cross-q. Does M'r S. D. Cozzens, counsel in this case, receive his pay from you or some other party?

A. He has not presented his bill to me yet.

14. Cross-q. Do you expect he will?

A. I do not know; I have never had a word with him on the subject.

15. Cross-q. Have you had a word with any other person or persons on the subject?

A. I have, and I expect the defendants in this case will be compelled to pay M'r Cozzens his bill, and have so talked with other parties.

16. Cross-q. When do you expect defendants are going to pay M'r Cozzens?

A. When we get through with this suit.

17. Cross-q. What do you mean by when we get through with this suit?

A. I mean when this suit is ended, closed up.

18. Cross-q. When do you think it will be ended and closed up?

A. I cannot tell when; I hope some time during my life.

19. Cross-q. What is the prospect of its being closed up in your life?

A. I think it is pretty good, that is, if I should live a reasonable length of time; and I am enjoying very good health now. I know the counsel for the defendants has stated to me that it would be a long time before this suit would be ended, and that it would cost me more than I would get out of it, even if I gained the case.

20. Cross-q. Who made that statement to you?

936 A. Stephen M. Whipple, in substance, for one, and M'r Blodgett, of Chicago, in substance, for another, about the time of the commencement of the suit, a short time before. I mean M'r Blodgett made the statement when I was commencing the suit.

21. Cross-q. When did Stephen M. Whipple make the statement in substance, and what was the substance in detail? Please state fully.

A. I cannot tell the time when. One time I recollect was in the Tremont House in Chicago before the case of Emigh against The Chicago, Burlington and Quincy Railroad Company was decided. I think some three or four years ago M'r Whipple and I were talking about that case. M'r Whipple said to me that he was very sure that the railroad company would gain that case; that the evidence clearly warranted such a belief. And then speaking of my case, he said that it would be a long time before we got through with the case, and if we ever did and I gained the case that it would cost me more than I would get. That is about what was said, as nearly as I can recollect.

22. Cross-q. Did you before taking the new proofs in this case have a conversation at the Girard House in this city, in relation to the extended term of this patent and the proofs in this case, with said Stephen M. Whipple?

A. I think there was something said about it between us.

23. Cross-q. Did you during that interview make the statement in substance that you could kill the extended term of the Tanner brake patent?

A. I think I said at that interview that I thought I could have prevented the patent's being extended. I did not say that I could kill the extended patent.

24. Cross-q. Did you or not say that you could put the extended term of said patent in such a light in substance that it could be purchased for a very small sum?

A. I do not recollect saying anything of that kind.

25. Cross-q. Did you or not state at that interview that you could refute the new proofs about to be taken in this case, and propose to tell me wherein you could do so, provided I would consent not to take them?

937 A. No, sir.

26. Cross-q. Did you or not say there could be a half million of dollars made out of this Tanner brake patent if these proofs were withheld, and did you not offer the said Stephen M. Whipple an interest therein if he would be a party to the withholding of said proofs, or in substance to this effect?

A. I have never heard anything about the withholding of any proofs in the case until now. I did not say that there could be a half million of dollars made out of the patent. I think I did tell M'r Whipple at that conversation that I was sure of gaining the case, after talking about the Camden and Amboy, or Tyler car brake, and if I did gain it, that the railroad companies would have to pay for the patent and extension not less than a million dollars. I did not offer M'r Whipple an interest in the patent. M'r Whipple said at the time that he was well aware of the value of the patent, if sustained, and that he knew they would have to pay a very large amount. He said at the same time that I had nearly all the railroad companies in the United States to fight, and that he was representing the most of them in defending this suit.

27. Cross-q. Did you or not, directly or indirectly, expressed or implied, offer the said Stephen M. Whipple a pecuniary interest in the proceeds of sales from the said Tanner patent, if he would consent to withhold the evidence from the Camden and Amboy road in this case?

A. I did not wish to have the evidence of the Camden and Amboy brake suppressed.

28. Cross-q. Did you or not in any way, directly or indirectly, attempt to influence the said Stephen M. Whipple, from pecuniary motives, not to proceed in taking the aforesaid evidence from the Camden and Amboy road?

A. I did not. On the contrary, I urged him to not delay the matter, but to put in the evidence at the earliest possible moment, for I was in a great hurry to get back to Chicago to attend to another patent suit that I had in progress there, and Stephen M. Whipple is the last man that I would attempt to make any arrangement with, of the
938 kind suggested by him. I do recollect of telling him at this
time that, no matter what he proved about the Tyler car brake or the Talson brake, I was very sure of gaining the case.

29. Cross-q. Did or did not the said Stephen M. Whipple say to you that he was not at liberty to enter into any such arrangement as you proposed, and as has already been indicated in the foregoing interrogatories?

A. I know nothing about it. Unless he means about hurrying up the case, or putting in the new testimony in the earliest possible moment, as I desired. I think he said that he had the responsibility of the case on him, and that he was not employed by the Chicago and Northwestern Railway Company alone, but by most of the railroad companies in the country, and that they were all interested in this suit or in the result of it, and he should take his own course and should not hurry the case any farther than was for the interest of those who employed him. He should look to their interest and not mine.

30. Cross-q. Did or not the said Stephen M. Whipple say to you, after you had laid your plans before him, that he was not at liberty to make any terms with you in relation to keeping back or not taking in full the evidence from the Camden and Amboy road, or matter to this effect?

A. I never heard anything about keeping anything back of the Camden and Amboy road before.

31. Cross-q. Did he or not say that he was not at liberty to compromise this matter between you and the railroad companies, or subject-matter to this effect?

A. I have never had any talk with M'r Whipple about a compromise of this case in any shape or manner whatever. I have never offered to compromise it with any party whatever since I commenced the suit.

32. Cross-q. Have you offered any inducement or inducements to any party or parties to withhold their evidence or modify it to suit your interests, directly or indirectly?

A. I have not.

939 33. Cross q. And do you swear the foregoing evidence upon your oath as a man and conscience before God?

A. I have sworn to the above facts, as is shown in the testimony.

34. Cross-q. As true, so help you God?

A. I have sworn to them.

35 Cross-q. And do you call God to witness that you have sworn truly?

A. I believe I understand the nature of an oath, and the consequence of swearing falsely, and I have testified to the facts as stated in this deposition.

36. Cross-q. Will you answer, yea or nay, to the last question; "and do you call God to witness that you have sworn truly?"

A. I have testified in this case to the facts that I have been questioned on as I knew them to be, and as I recollected them.

37. Cross-q. Dare you call God to witness that you have sworn truly?

A. I would dare do so, were it necessary.

38. Cross-q. And have you sworn to the truth, so help you God?

A. I believe the oath was administered to me by the examiner in similar form to the question, at the commencement of this deposition.

39. Cross-q. Question repeated. And have you sworn truly in this case, so help you God?

A. I have sworn truly.

THOS. SAYLES.

Subscribed and sworn to before me this 15th day of April, 1868.

JOSEPH GUTMAN, Jr.,
Examiner, &c.

Examination adjourned to April 16th, 1868, at 10 a. m.

New York, *April 16th*, 1868—11 a. m.

940 Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

Thomas M. North, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Thomas M. North; I am forty-three years of age; I reside in the city of New York, and am a lawyer.

2. Q. Will you please state whether you were formerly secretary and attorney of the Hudson River Railroad Company; and, if so, in about what year did that connection commence, and in what year did it terminate?

A. I was. I acted as counsel from 1850 to 1866; as attorney and secretary during most of that time. I was attorney of record in most of their suits from 1851 or 1852 to 1866.

3. Q. Do you remember a suit brought, in or about 1853, by Henry Tanner against the Hudson River Railroad Company for an infringement of the so-called Tanner double-acting car-brake patent; and, if so, did you take part in that suit as attorney and counsel for the defendant?

A. I remember the suit. I was attorney for the defendant and one of the defendant's counsel; the one who had the active charge of preparing the suit for trial.

4. Q. Will you please state whether, in the preparation of that case on the part of the defendant, any investigations were made in different parts of the country relative to double-acting car-brakes; and, if so, will you state what was the object of those investigations, and what was their character, whether full or otherwise? Please answer fully.

941 A. Such investigations were made by me and under my direction. Their object was to ascertain whether the invention claimed in the Tanner patent had not been previously made by others, and to ascertain the precise nature of the brakes which had previously been in use, and the character of their use. The investigation was as full, complete, and thorough as I had the ability to make it. So far as I know, I thoroughly examined every invention bearing upon the case.

5. Q. Will you please mention some of the places or railroads to which these investigations extended, and some of the persons who aided, under your direction, in making these investigations?

A. At this lapse of time I can only state the principal ones. There were many investigations at different places and from different persons, which resulted in nothing, and have passed from my mind. I remember that I was aided by M'r Gifford, M'r W. W. Hubbell, and John H. Reynolds as my counsel, and consulted with the counsel of various other railroads as to matters of law. As to matters of fact, I had some help from them, but more from the officers of the Hudson River Railroad, and M'r Stevens, M'r Nehemiah Hodge, and others whose names I do not now recall. My attention was finally directed mainly to two inventions, one, I think, at Springfield, certainly upon one of the New England roads, and the other upon a New Jersey road.

6. Q. Will you look at the copies of notices of special matter in the action at law of Tanner against the Erie Railroad Company, printed in the defendant's proofs in this case, and state whether such notices refresh your recollection in respect to any places other than those which you have mentioned, at which investigations were made in the suit referred to against the Hudson River Railroad?

(Defendant's counsel objects to the witness referring to the matter referred to in the question.)

942 A. They do not materially. I have a general knowledge of all the matters and of all the persons mentioned in those notices, but cannot now recall where or under what circumstances I investigated each of them. My impression is that, as to some of them, I relied upon the investigation of M'r Eaton, counsel for the Erie Railroad, but not as to the ones I have before mentioned. I also remember what is not stated in that notice or recalled to my mind by it, that I went to Boston and there investigated the matter with reference to several of the roads leading out of Boston.

7. Q. Were M'r Stevens and M'r Hodge employed on behalf of the Hudson River Railroad in that suit to make investigations relative to double-acting brakes?

A. I do not think that they were employed in the sense of being paid specially for that purpose. They did, in point of fact, make such investigations, and consulted with me in reference thereto repeatedly, M'r Stevens quite frequently. I understood that they were acting in reference to their own interests as patentees of an invention which the Tanner patent claimed to supersede, they both having sold the Hudson River Road rights under their respective patents.

8. Q. You have spoken of having had your attention in these investigations called mainly to a road in New Jersey and to a New England railroad. Will you state what was the matter to which your attention was so called in reference to the New Jersey Railroad?

A. A M'r Talson who had been employed upon that road and whom I saw on several occasions made me statements in regard to the use of a double-acting brake upon that road, and made me drawings, and gave me explanations of the mechanism employed.

9. Q. State if you know what position this M'r Talson had formerly occupied on said New Jersey Railroad?

A. He had some charge of some department or shop. My impression is master-mechanic or duties corresponding to that office.

943 10 Q. Please state to the best of your recollection what was the substance of the statements referred to by you, made by him in reference to said brake on said New Jersey Road?

A. The substance was that he had put upon one of the cars of that road a brake which he called the Stanley brake; the name was Isaac Newton Stanley; that it had been run over the road several trips. I think as many as three or four on one occasion; that it had been repaired or adjusted and tried again on more than one occasion; but I cannot now recall exactly how many. I cannot say with certainty the number of trips which he told me the car had made with that brake upon it. It was a small number, and its use had been discontinued from that period, which was some years previous to my interview with him, and had not been subsequently used; my recollection is that it was a baggage-truck upon which that brake was applied—a truck upon which they carried the crates.

11. Q. Did he say anything more to you on this subject than you have above stated in substance?

A. He said a great deal more in words. I talked with him for hours in all at different times. I think I have stated substantially all that was material to my investigation. My object was to ascertain the date of the invention, its nature, and the character of its use. The date was prior to the invention of Thompson and Batchelder, patented by Tanner; the nature I could not now state in the absence of drawings or means of illustrating; the character of the use was substantially as I have stated.

12. Q. Did he, in any of his interviews with you, say anything to you about what double-acting car brakes, operated from either end of the car, he had known about in his experience; and if so, what did he say?

A. We talked about the various inventions which I was investigating, and from which or some of which I hoped to make a defence to the action. My impression is that the Turner brake and the Springfield brake were discussed between us, and other brakes as compared with the Stanley brake, which he informed me about. I don't remember that he had had experience of any of them except the Stanley brake. 944 He certainly did not speak of any other brake in the same way that he did of the Stanley brake, as having been applied by him or under such circumstances that he had any special interest in it, or special knowledge about it.

13. Q. Did he say anything to you in any of these interviews about

whether he knew of any double-acting brake operated from both ends of the car, other than the Stanley brake, before he left the New Jersey Railroad; if so, what did he say?

A. The only one which he spoke of was the Stanley brake. He did not inform me of any other. He said that the Stanley brake was the first invention of a double-acting brake, and claimed that his right was superior to all rights under other inventions.

14. Q. Did he say anything to you in any of those conversations, or intimate in any way anything about the use on any car or cars belonging to the Camden and Amboy Railroad, of a double-acting car brake?

A. Nothing except as I have above stated.

15. Q. How active a part did said Talson take at this time, in reference to these investigations regarding said brake on the New Jersey Railroad?

A. He had several interviews with me and talked very freely and with much apparent interest, and appeared to be very desirous of defeating Tanner and of substantiating the priority of the Stanley brake. I understood that he claimed an interest in that invention.

16. Q. After the investigations of which you have above spoken were completed, including this in reference to the Stanley brake, what conclusion did you come to in respect to being able to make out a defense in Tanner's suit against the Hudson River road?

A. The case was called for trial in the fall of 1853 at Albany. I had, previous to that time, exhausted all the means for information which I could obtain, and on consultation with M'r Gifford and M'r Hubbell, we came to the unanimous conclusion that we had no defense to the action and no clue which gave us any reasonable hope of discovering any.

945 17. Q. What was therefore done in the suit?

A. A negotiation with M'r Tanner followed which resulted in the defendant's paying $1,000 and the costs of the suit, and the suit was therefore discontinued.

18. Q. Was there, at any time or in any respect, any collusion in reference to said suit between the railroad company and the plaintiff, or any one on his behalf?

A. There was not.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Cross q. Was it known before the payment of $1,000 that the case could be settled for that amount, or rather before the discontinuance of the suit?

A. The agreement to pay $1,000 was made before that amount was actually paid or the suit discontinued.

2. Cross-q. Was it deemed by you, as counsel for the Hudson River Railroad Company, for the interests of said company, to pay the sum of $1,000 rather than to be to the expense of contesting the suit?

A. I was not acting with reference to the expense of defending the suit, which had been mainly already incurred, so much as from apprehension of the damages which the plaintiff would recover if the cause was tried.

3. Cross-q. At the time of bringing this suit, was the plaintiff, Henry Tanner, in any way or capacity in the employ of the Hudson River Railroad Company?

A. No, sir.

4. Cross-q. Was he ever in their employ?

A. He never was before that time. He some time after adjusted some claims made against the company, for personal injuries at Rochester and elsewhere. Never in any other way was employed by them.

5. Cross-q. Was this sum paid before or after the trial of said Tanner against the New York and Erie Railroad in which this Batchelder and Thompson patent was in issue?

946 A. It was in the latter part of 1853 before the Erie Railroad suit was tried, I think.

6. Cross-q. Had the suit against the New York and Erie road been commenced before this suit with the Hudson River road was settled?

A. It must have been actually commenced, or have been threatened and been expected.

7. Cross-q. Do you wish to be understood that the said Talson claimed that the Stanley brake was the first double-acting brake he had ever seen or known, and that he claimed that this brake had priority of right over all other inventions of this kind?

A. Yes, sir; that was very strongly impressed upon my understanding.

And being re-examined by M'r Cozzens, of counsel for complainant, he deposes and says:

1. Redirect q. You have stated that Talson claimed that the Stanley brake was the first double-acting brake he had ever seen or known. Did he say anything about this Stanley brake as tried on the New Jersey Railroad, as you have said he told you, being the only double brake operated from both ends of the car which he had ever known of, up to the time he left the New Jersey Railroad; if so, what did he say about it?

A. There is nothing in my mind about the time of his leaving that road which would enable me to answer with reference to that date. He did not speak of any double-acting car-brake other than the Stanley brake as being known to him except the Turner, Tanner, and other brakes with which I had been before familiar; certainly not of any other upon the New Jersey road, so far as I remember.

THOMAS M. NORTH.

Subscribed and sworn to before me this 16th day of April, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

947 Examination further adjourned to April 17, 1868, at 2 p. m.

APRIL 17, 1868—2 p. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

MILES G. MOIES, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Miles G. Moies; I am fifty years of age; reside in the city of New York; I am at present a real-estate broker.

2. Q. Were you formerly engaged upon a railroad; and if so, upon what railroad and in what capacity?

A. I was formerly engaged on the Western Railroad of Massachusetts, at the Albany end. In 1844 I went from there on the Connecticut River Railroad, at Northampton. In 1844 I acted in the capacity of master-mechanic and general superintendent of that road. That is, I had the general superintendence of everything on the road. I was there from 1844 to 1850 in that capacity.

3. Q. About what time, in 1850, did you leave the Connecticut River road?

A. In December, 1849, or January, 1850.

4. Q. Were you acquainted with the late Nehemiah Hodge, patentee of the so-called Hodge car-brake; and if so, how long did you know him?

A. I was personally acquainted with him, and quite intimate with him from 1849 or 1850, until his death, some two or three years ago.

948 5. Q. Were you ever connected with the said Hodge in the matter of introducing the said Hodge brake upon railroads?

A. I was connected with him as agent, and had part of the proceeds.

6. Q. Did you, in the course of this agency, or connection with the said Hodge, go to the Camden and Amboy Railroad?

A. I did.

7. Q. About when did you go there?

A. I think it was in 1851.

8. Q. For what purpose did you go there at that time?

A. To introduce the Hodge brake on that railroad.

9. Q. Please state what place on that road you went to at this time, and what person or persons you saw there.

A. To Bordentown, and saw the two head men, the master-mechanic and the superintendent of repairs of cars.

10. Q. Did you have any conversation at this time with these men, or either of them? And if so, state the substance of such conversation.

A. I spent nearly the day with the superintendent of the repairs of the cars, and conversed with him on double brakes, and explained to him wherein I thought the Hodge brake was superior to any other brake, and the grounds that I took were that the Hodge brake gave twice the power to those that he was then using, and he told me that if what I explained to him was true he would do all in his power to introduce it on the road. He then requested me to call on M'r Stevens in New York. I made the effort, but did not see him.

11. Q. What kind of brakes was he then using?

A. I saw nothing but the common brakes to each truck; that is, one that braked only on four wheels.

12. Q. You say that he told you that if what you explained to him was true; please state fully what you did explain to him.

A. I explained to him what he did not understand at first, that by taking four Salter's balances and attaching them to two levers

949 with a connection, he could demonstrate that what I said was true; that he could get twice the power that he could with any other brake, less one-sixteenth for friction; that this would save the advantage of one man on a car, being double the power of any other brake. After explaining it to him in that way he then began to see it as I did, and requested me to call on M'r Stevens with my models which I had in New York.

13. Q. You said in the 10th answer that he told you if what you explained was true he would do all that was in his power to introduce "it" on the road; state what it was that he said he would do all in his power to introduce.

A. The Hodge brake.

14. Q. What was it which, if true, he would do all in his power to introduce the Hodge brake on the road?

A. The saving of one half the help on the train to produce the same result.

15. Q. What kind of help?

A. Brakemen.

16. Q. At the time of this visit of yours to Bordentown, had the Hodge brake been introduced on said Camden and Amboy road?

A. It had not.

17. Q. You say you made the effort to see M'r Stevens on this subject; did any one go with you to see him; if so, who?

A. M'r Hodge, Nehemiah Hodge, the patentee of the Hodge brake.

18. Q. Who was M'r Stevens whom you and Hodge thus tried to see?

A. I believe he was president of the road.

19. Q. Did you yourself, after this effort to see M'r Stevens, do anything else to endeavor to introduce this Hodge brake on the said Camden and Amboy road? If you did not, state why not.

A. I did not. I was obliged to leave the city.

20. Q. Who, if any one, then took charge of the introduction of it on said road, or of trying to get it introduced?

A. M'r Nehemiah Hodge.

950 21. Q. Did you at this visit to Bordentown to which you have referred hear anything said by either the superintendent of the repairs of cars or the master mechanic whom you saw there about their having used on the Camden and Amboy road double-acting brakes operating on all the wheels of the car from either windlass?

A. All they said was they did not believe much in double brakes. They said nothing to me about their having used such brakes on that road.

And being cross-examined by M'r Whipple, of counsel for defendant, he says:

1. Cross-q. You say you left the Connecticut River road in December, 1849, or January, 1850. Please state how you were employed for the remainder of the year 1850.

A. Traveling all over the country. I was furnishing railroads with material from one end of the country to the other, from New Orleans to Penobscot.

2. Cross-q. Did this kind of service use up the whole of 1850?

A. I continued doing this for three years.

3. Cross-q. What did you do for M'r Hodge in introducing brakes in 1850, and to what roads did you go for that purpose?

A. There was hardly a road in the country where I did not talk about it. I could name almost any road that went out of Boston. In the State of New York I talked with the Central Railroad, and with the Erie. I called upon the Reading road, in Pennsylvania.

4. Cross-q. What other roads do you recollect calling upon in 1850?

A. The roads that run south from Washington.

5. Cross-q. Did you call upon any roads in the State of New Jersey in 1850?

A. The Camden and Amboy, which I have spoken about.

6. Cross-q. What time in the year 1850?

A. I could not state the time.

951 7. Cross-q. State as near as you can.

A. I could give it to you nearer if you would give me the date of the first year of the World's Fair.

8. Cross-q. Was it in the middle or latter part of the year 1850?

A. I think it was in the middle.

9. Cross-q. Did you call there more than once about the Hodge brake

A. I did call there several times. Every time I went I talked about the Hodge brake.

10. Cross-q. You have stated in answer to the 7th interrogatory that you thought it was in 1851. Was that the time when you called about the Hodge brake?

A. I called so many times that I do not know exactly how to answer it. I was calling there for three years, about once every two months.

11. Cross-q. Are you positive that you called on the Camden and Amboy road for the purpose of introducing the Hodge brake in the year 1850?

A. I would like to explain to you all. I am not positive whether it was in 1849 or 1850 that I left the Connecticut River road. It was within a year after I left that road.

12. Cross-q. Are you positive that you called on the Camden and Amboy road for the purpose of introducing the Hodge brake in the year 1851?

A. I feel sure I did.

13. Cross-q. Was a settlement effected with the said Camden and Amboy road for the use of said Hodge brake on that road while you were agent for M'r Hodge?

A. All I know is what Hodge told me. He told me he had introduced it there.

14. Cross-q. Did you go more than once to the Camden and Amboy road for the purpose of introducing the said Hodge brake on that road?

A. Only once exclusively for that.

15. Cross-q. And this was in 1851, was it?

A. I think it was.

16. Cross-q. What time in that year, should you judge?

A. Some time in the middle of the year.

952 17. Cross-q. After this time, to wit, in the middle of the year 1851, did the said Camden and Amboy road conclude to apply the Hodge brake to a car of that road?

A. All I remember is what M'r Hodge told me, that they had concluded to apply it.

18. Cross-q. Had there been an application of the said Hodge brake to a car or cars of that road before you called there in the middle of the year 1851?

A. None had been introduced there previous to my calling there to introduce it for the first time.

19. Cross-q. And this first time was in the middle of 1851, was it?

A. To the best of my recollection.

20. Cross-q. Are you quite sure of it?

A. As I said before, I could not swear positively whether it was 1850 or 1851.

21. Cross-q. Do you know what brakes were in use on the cars of the Camden and Amboy Railroad at the time you called on said company to introduce the Hodge brake in 1851?

A. All I saw was the brake applied to a single truck, two pair of wheels.

22. Cross-q. Do you know of your own knowledge that there was no double-acting single centre-lever brake in use on the cars of that road at the time you called to introduce the Hodge brake?

A. I saw none, nor heard of any.

23. Cross-q. Do you know there was none?

A. I do not.

24. Cross-q. Are you familiar with the construction and operation of the Tanner centre-lever brake and the Hodge double-lever brake ?

A. I was and am.

25. Cross-q. Please describe the distinguishing features of the two brakes, wherein they differ in construction and operation.

A. The Tanner brake has a single lever in the middle of the car; chains or rods ran to it from the windlasses at each end of the
953 car, and if a man put on a hundred-pound pressure at one end he
would divide it between the two trucks. The Hodge brake had two levers, a movable fulcrum. If a man put on a hundred pounds on one end of the car he had a hundred pounds on both trucks, less about one-sixteenth for friction.

26. Cross-q. Do you wish to be understood that the Hodge brake gave twice the power to each truck that the Tanner or centre-lever brake did ?

A. I do.

27. Cross-q. Was that the particular point that you urged upon the attention of the Camden and Amboy Company when you went to introduce the Hodge brake ?

A. That was my leading point.

28. Cross-q. Was that the prominent reason given to induce the Camden and Amboy Company to make a trial of the Hodge brake ?

A. The prominent reason was that it saved half the help.

29. Cross-q. Was there in addition to this the other reason that it communicated double the power to each truck ?

A. It communicated twice the power to the car of any other brake.

30. Cross-q. Did you, while at the Camden and Amboy road to introduce the said Hodge brake, discuss the merits of the centre-lever brake and the Hodge brake in comparison ?

A. We discussed everything in the brake line.

31. Cross-q. Was the centre-lever brake named in the discussion ?

A. I don't remember any particular one.

32. Cross-q. You say every brake was discussed; was the centre-lever brake included in the number ?

A. Our discussion was very general on brakes.

33. Cross-q. Will you please give an answer responsive to the question ?

A. I can't say that any particular brake was mentioned.

34. Cross-q. Did you explain to said company the distinguishing feature of the Hodge brake over the centre-lever brake ?

954 A. I did not.

35. Cross-q. Did you over any other brake ?

A. Not that I remember.

36. Cross-q. What significance do you then attach to this matter of explanation, if there was no other brake brought in comparison with the Hodge brake ?

A. The great saving of help and of damages on roads.

37. Cross-q. Were you aware of the existence of the centre lever brake when you went to the Camden and Amboy road to introduce the Hodge brake ?

A. I was, for I had experimented with one myself.

38. Cross-q. Did you name this centre-lever brake while on the Camden and Amboy road, for the purpose of introducing the Hodge brake ?

A. I don't remember that I did.

39. Cross-q. Do you think you did ?

A. I might have done it.

40. Cross-q. Do you think the Hodge brake has superior advantages over the Tanner Brake?

A. I do.

41. Cross q. Do you think you named these advantages while discussing the merits of brakes while on the Camden and Amboy road to introduce the Hodge brake?

A. I don't remember of saying anything about the Tanner brake, and don't renember of knowing it at that time, or of ever hearing of it.

42. Cross-q. Have you not just said that before you went on the Camden and Amboy road to introduce the Hodge brake that you did know of the centre lever or Tanner brake?

A. I never knew of the Tanner brake; I knew of a centre-lever brake. I will explain to you all. I experimented in the application of brakes of different kinds, two levers and one lever, and with pulleys, and found them all a failure until I got to the Hodge brake.

43. Cross-q. While on the Connecticut River road did you know of the use of a centre lever brake on the Hartford and Springfield road, running in connection with the Connecticut River road, applied to
955 the cars of the said Hartford and Springfield road by one Willard J. Nichols, about the year 1847, and used on the cars of said road thereafter for a number of years?

(Objected to, because it has been specially decided already in this case by the court that this Nichols brake was not put on any car of the Hartford and Springfield road until the spring of 1848.)

A. I have no knowledge of what they used on the Hartford road.

44. Cross-q. Do you swear positively that you never knew of the use of the centre lever brake on the Hartford and Springfield road prior to the time of your going to the Camden and Amboy road to introduce the said Hodge brake?

A. I cannot. I mean to convey that I have no knowledge of such a brake being on that road, and I don't know that I ever had.

45. Cross-q. While you were in the employ of Nehemiah Hodge as agent in introducing his brake, did you ever hear him speak of a centre-lever double brake?

A. I don't remember of hearing him talk about it.

46. Cross q. Then you wish to be understood, do you, that while you were acting as agent for Nehemiah Hodge in introducing his brake, to wit, in the years 1850 and 1851, as you say, you heard and knew nothing of the use of a centre-lever double-acting car brake?

(Objected to because the witness has not stated any such thing.)

A. No, sir. I do not wish to be understood so. I did know of a centre lever brake, and tried it myself.

47. Cross-q. Please describe the centre-lever double brake that you did know about.

A. The lever was attached to the centre of the car underneath, and a chain or rod ran from the windlass to the lever, and the same to the brake on the truck.

956 48. Cross-q. Was it the same as is now known as the centre-lever double acting brake?

A. I do not know what is called now the centre lever double acting brake.

49. Cross-q. Did the brake you know of have a centre-lever attached to the body of the car, said lever having four connecting rods, one to the brake lever in each truck, and one to each windlass at the end of the car? If it was not such a brake as the question has described, please tell wherein it differs.

A. It was such a brake as you describe.

50. Cross-q. Then did you know of the use of such a brake as above described when you went to the Camden and Amboy road to introduce the Hodge brake?

A. Have I not answered that question three or four times already, that I did know of such a centre lever brake?

51. Cross-q. And yet you made no mention of this brake while introducing the Hodge brake on the Camden and Amboy road, did you, or did you not?

A. I don't remember of talking over any particular brake, but we talked over the merits and demerits of brakes generally.

52. Cross-q. The centre level brake among the rest, or not?

A. I cannot say.

53. Cross q. Will you swear positively that you said nothing about a centre-lever brake at the time you were trying to introduce the Hodge brake on the Camden and Amboy road?

A. I cannot.

54. Cross-q. Will you swear positively that no other person with whom you conversed said anything about it, while introducing the said Hodge brake as aforesaid?

A. I cannot.

And being re-examined by Mr. Cozzens, of counsel for complainant, he deposes and says:

957 1. Redirect q. How do you mean to be understood about the year when you went to introduce the Hodge brake on the Camden and Amboy road, respecting whether it was in 1850 or 1851?

A. It was about a year after I left the Connecticut River Railroad, and I cannot say positively when I left the Connecticut River Railroad. I am sure it was either in 1850 or 1851 that I went to the Camden and Amboy road to introduce the Hodge brake. I am not positive in which of those two years it was.

2. Redirect q. You have said in your 34th and 35th cross-answers that you did not explain to the Camden and Amboy company the distinguishing feature of the Hodge brake over the centre-lever brake, nor, as you remember, over any other brake. How do you mean to be understood in this?

A. I mean to be understood that the leading point I made with the Hodge brake was its saving of expense in brakemen and its great features in stopping a train so that it would be less liable to accidents. I mean to be understood that the Hodge brake had superior advantages to the brake that applied only on four wheels. By the 34th and 35th cross-answers I mean to be understood that I compared the Hodge brake with the brakes in general use, applied to a single truck—four wheels.

3. Redirect q. To make this matter entirely clear, I will ask you this: In explaining the Hodge brake to the master mechanic and superintendent of car repairs of the Camden and Amboy road, at the visit to Bordentown, of which you have spoken, what kind of brake was spoken of by you in connection with the Hodge brake?

(Objected to.)

A. The brakes that they were generally using—a single brake that applied to one truck—the only brake that I saw at the depot at Bordentown.

958 4. Redirect q. Did that master mechanic and superintendent of car repairs say anything to you at that visit about any other kind of brake than those which you saw at the depot, applying to one truck, having ever been used on the Camden and Amboy road?

A. Not to my knowledge.

5. Redirect q. You have said in your cross-examination that you tried yourself a centre-lever brake. Please state about when you tried it, and where and what was the object of the trial?

A. The first knowledge that I had of it was on the Western Railroad, at the Albany end, in 1844, and afterwards on the Connecticut River Railroad, up to the time that we introduced the Hodge brake, from 1844 to 1849—not all the time between those two years. I could not say how much of that time, we tried so many different kinds; when we would fail we would try something else. The object of the trial was to improve on the old single brake.

6. Redirect q. What was the character of these attempts, experimental or otherwise?

A. Experimental and bad.

And being further cross-examined by M'r Whipple, of counsel for defendant, he says:

1. Recross-q. Among these experiments you have spoken of, was the centre-lever double brake tried, such as you have already described in your deposition?

A. Yes.

2. Recross-q. The same as is now known as the centre-lever brake, and in use on some roads?

A. I do not know what they are using now; I have paid no attention to it for ten years.

3. Recross-q. Was it such a brake as was in use during the time you were agent and travelled in various parts of the country, as alluded to in the fore part of your deposition, to wit, in 1852, 1853, and 1854?

A. Agent for whom?

3½. Recross-q. Railroad agent.

A. I often saw such a brake in use.

959 4. Recross-q. Are you positive that you called upon the Camden and Amboy road to introduce the Hodge brake about a year after you left the Connecticut River Railroad?

A. It was in 1850 or 1851.

5. Recross-q. Which year do you think it was?

A. I think it was in the spring of 1851.

6. Recross-q. Please state the name, if you know, of the person upon whom you called at Bordentown, with the view of introducing the Hodge brake, and who you say was superintendent of the repairs of the cars of that road?

A. I don't remember.

7. Recross-q. Was the name Edwin Lockwood upon whom you called on this business?

A. I do not remember.

8. Recross-q. Do you know that he was superintendent of repairs of cars, or have you good reason to believe he was?

A. He told me he was.

9. Recross-q. Do you wish to be understood that M'r Hodge, patentee of the Hodge brake, informed you that he had settled with the Camden and Amboy road for the use of his brake, after you had called upon the company for the purpose of introducing it?

A. I do not. He did not tell me that he had settled for the use of it, but that they were going to introduce it and apply it on their road.

And being further re-examined by M'r Cozzens, of counsel for complainant, he deposes and says:

7. Redirect q. You spoke in you first recross-answer of trying a cen

tre-lever double brake; was that brake used for any length of time, or was it an experiment?

A. I believe it was abandoned in full before 1849.

8. Redirect q. At the time you made the visit to Bordentown, did you know of any brake by the name of the Tanner brake?

A. I had not heard of it at that time.

960 And being further cross-examined by M'r Whipple, he deposes and says:

10. Recross-q. Was the brake alluded to as tried by you, to wit, a double-acting centre-lever brake, the same as went into use more or less thereafter?

A. It was similar to the one that is called the Tanner brake?

11. Recross-q. Wherein was it different from the Tanner brake?

A. I don't know of any difference.

12. Recross-q. Then it was in all essential particulars the same as the Tanner brake, was it?

A. I don't remember of any difference.

And being further re-examined by M'r Cozzens, of counsel for complainant, he says:

9. Redirect q. Will you look at the book now shown you, which is a printed copy of the first proofs taken by the defendants in this case, and state whether you are the person named at pages 38, 39, and 41 of said book as Miles G. Morse, and at page 43 thereof as Miles G. Morse and Miles G. Marses, and at page 45 as Miles G. Morse?

I presume I am; I never heard anything about it.

MILES G. MOIES.

Subscribed and sworn to before me this 17th day of April, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to April 18th, 1868, at 11 a. m.

961 United States circuit court, northern district of Illinois.

THOMAS SAYLES
versus
THE CHICAGO AND NORTHWESTERN RAILWAY COMPANY.
} In equity.

Testimony taken on behalf of the above-named complainant, at Chicago, in the northern district of Illinois, before Philip A. Hoyne, esq., examiner, &c., under and in pursuance of notice in writing duly served upon Mess'rs Blodget & Winston, solicitors for the defendants, as follows:

CHICAGO, *May 1st*, 1869.

Deposition of Ryniear Van Syckel.

Int. 1. What is your name, age, residence, and occupation?

A. My name is Ryniear Van Syckel; my age 57; I reside near Rockford, Illinois; I am a farmer.

Int. 2. How long have you been farming?

A. Eight years.

Int. 3. What was your business for 20 years previous to 1860?

A. I was fireman and engineer on railroads.

Int. 4. When, and on what railroad did you commence as engineer?

A. On the Camden and Amboy Railroad; I commenced some time between 1840 and 1842, I think.

5. How long did you continue as engineer on the Camden and Amboy Railroad?

962 A. During and until 1846.

6. What did you do after '46?

A. I went on the Paterson Railroad, from Jersey City to Paterson, as engineer; I was there between 4 and 5 years; do not know exactly the time.

7. What did you do after that?

A. I went on the Burlington and Mount Holly Road, a branch of the Camden and Amboy Road, as engineer; I remained there till the year 1851; from there I went back to the New Jersey Railroad, and remained on the Jersey road till the spring of 1860—it was the Paterson and Jersey road, from Paterson to Jersey City; after running on there about two years I then went to the New Jersey Railroad and Transportation Company's road.

8. Do you recollect of John Tyler passing through New Jersey, while he was President of the United States? if yea, when was it?

A. I do recollect; it was in 1843.

9. Do you recollect the car that he rode on while passing through New Jersey at that time? If so, describe it.

A. I do. It was on a six-wheel truck car. Car got up very nicely. It was fitted up with different kind of seats. Privy on the platform. Looking-glasses at each end. It was one of the first six-wheel trucks that was used. Elliptic springs and spiral springs.

10. Who got up that car, and about when?

A. The Camden and Amboy company. It was a car overhauled by the company, from the Trenton and Philadelphia road. It was some time between 1842 and 1843 and got up expressly for carrying Mr. Tyler on that road. It was fitted up expressly for this purpose.

11. Do you know what kind of brakes were put on that car when it was rebuilt in 1842 or 1843, as you say?

A. I do.

12. What kind of brakes were they?

A. They were single-acting brakes on each truck.

13. How did they operate?

963 A. They operated with a crank at each end of the platform. They wound up with a windlass at each end, and operated on one truck at each end.

14. State, if you know, how long that single brake was continued on that car?

A. It was on the car when I left the road in 1851.

15. Do you know what brakes were used on the other cars belonging to the Camden and Amboy road? I mean passenger and baggage, or crate cars, between 1842 and the time you say you left the road in 1851? If so, please state.

A. I do. The brakes used were similar to the brakes on the Tyler car. They were single-acting brakes, operating on one truck at a time on each end of the car. They also used some foot brakes, used with the foot, and some were used by the crank.

16. Could there have been any double-acting brakes, operating on both trucks from either end of the car, used on any of the Camden and Amboy cars before you left the road, in 1846, for any length of time, and you not have known it?

A. No, sir.

17. What was this car called that Tyler rode on?

A. It was called the Tyler car.

18. While this Tyler car was being rebuilt, did you have occasion to notice the car frequently while it was being built as you say?

A. I did.

19. Why did you frequently notice it?

A. Well, the car was getting up in good style, different from any being built.

20. Did or did not said Tyler car run in any of the trains of which you were engineer? If so, state about how often, as near as you can recollect.

A. Yes, sir. It run daily between Trenton and New York; that is—go one day and come back the next day. Sometimes it would run on the Camden and Amboy road from Camden to Amboy. Sometimes on other routes to Jersey City.

964 21. While you say you were on the Paterson road running from Paterson to Jersey City, did you ever see this Tyler car and other cars of the Camden and Amboy road? If so, where, and about how often?

A. I used to see them almost daily at the Jersey City depot, or on the road; I saw the Tyler car occasionally, perhaps once in two weeks, and perhaps oftener.

22. While you were on the Burlington and M't Holly road, the branch of the Camden and Amboy road, as you say, did you or did you not see the cars of the Camden and Amboy road, running from Camden to Jersey City, and from Camden to Amboy? If so, about how often?

A. I run to meet those trains every day twice a day, except Sundays.

23. Did you occasionally see the Tyler car in those trains?

A. I did. I frequently saw it, but cannot state how frequently.

24. Are you acquainted with the construction and operation of the centre-lever double-acting brake, called the "Tanner brake"?

A. I am.

25. When and where did you first see such a brake on a car?

A. On the New Jersey Railroad and Transportation Company cars or car. It was about the time the Hackensack bridge was burnt down. It was somewhere about 1851 or 1852.

26. State, if you know, who put that brake on the car?

A. It was a M'r Baker (David H. Baker). He was a car-builder for the New Jersey Railroad and Transportation Company.

27. Did you ever see any double-acting brakes on any of the Camden and Amboy cars? If so, when first?

A. I never saw any until after the one on the New Jersey road, which Baker put on, as I have stated. A short time after this I saw one on the Tyler car.

965 28. Was it the same, or different, from the one Baker put on?

A. It was different—it was what was called the Hodge brake—it had two cross-levers under the body of the car; the one that Baker put on had only one cross-lever under the body of the car.

29. Was that the first double brake you ever saw on any of the Camden and Amboy cars?

A. Yes, sir.

30. While you were engineer on railroads, were you or were you not in the habit of noticing improvements that were put on the cars run in your trains?

A. Yes, sir.

31. What if anything was said about double brakes, in your hearing, about the time you say you first saw them on the cars?

(Question objected to by counsel for defence.)

A. There were different opinions expressed. Some were in favor of one brake and some in favor of the other. That is, some were in favor of the Hodge brake, and some in favor of the Tanner brake.

Cross-examined by H. W. Blodget:

1. Cross. Who have you conversed with lately on the subject of this deposition?

A. M'r Sayles.

2. Cross. When did you first see and talk with him?

A. Last Wednesday.

3. Cross. Who introduced him to you?

A. He introduced himself, at my house, last Wednesday afternoon.

4. Cross. How long did he remain and talk with you on the subject?

A. Only a short time, about half an hour, hardly that, not more I do not think.

966 5. Cross. Did he bring any letter of introduction to you?

A. No, sir.

6. Cross. Who did he tell you had sent or referred him to you?

A. George Moore and others.

7. Cross. When, prior to said interview with M'r Sayles, had you thought over, or had your attention called to this brake matter?

A. I received a letter from M'r Sayles the 25th of March, I think; at any rate, the letter lay in the office until about that time. I did not think any more about the letter; it laid there. I did not answer the letter. The letter called my attention to it, and I thought of it between the time of the letter and seeing M'r Sayles. I had not thought of it previous to that. I was out of railroading, and had no occasion to think of it.

8. Cross. You say the Tyler car had six-wheel trucks, and spiral and elliptic springs. Where, in said trucks, were the spiral, and where the elliptic springs? Describe how they were put into the truck.

A. The spiral springs were put in over the box; that is, over the journal; and the elliptic springs was put on the centre, under the frame, on the equalizing bar.

9. Cross. How were the brakes worked?

A. They were worked by a crank on each end of the platform of the car.

10. Cross. Was there a pawl and ratchet to hold the brakes when set?

A. No, sir.

11. Cross. How were they held?

A. They was held by the hand on the lever or crank.

12. Cross. Did you, at the time the Tyler car was being built, or at any other time before you left the Camden and Amboy road, in 1846, hear the subject of a double brake discussed or mentioned? If yea, by whom?

A. I did not. I have no recollection.

13. Cross. Why was your attention particularly called to the brakes on the Tyler car?

967 A. Well, it was a nice got-up car, and we all paid more attention to that car, being a nice car—being a six-wheel truck car, and different to any of the rest—they being four-wheel trucks. This was the first six-wheel truck car.

14. Cross. Then you noticed the brakes particularly because the car

was a nice one, and had more wheels in its trucks than the others, did you?

A. Yes, sir.

15. Cross. What were you doing at the time the Tyler car was being rebuilt?

A. I was running a locomotive on the road, as engineer.

16. Cross. Where did you reside at that time?

A. At Bordentown, New Jersey.

17. Cross. What was your route?

A. We did not run on particular routes them days; the rule was, first in first out. Sometimes we had a freight and sometimes a passenger train.

18. Cross. Who had charge of the work in rebuilding the Tyler car?

A. M'r Lockwood.

19. Cross. Who worked on said car in rebuilding it?

A. I could not say. Letchworth Cox was one. There were others I cannot name.

20. Cross. Had you anything to do while on the Camden and Amboy road with the construction or repair of cars, or the brakes on the cars?

A. No, sir; not on the cars. I had on the tenders, which is the same thing as the cars.

21. Cross. Was there not a double brake put upon the tender on said Camden and Amboy road while you were there, between 1843 and 1846?

A. Not that I recollect of. The brakes operated from each end of the tender. There was a brake for each truck. There was a man, in those days, rode on the back part of the tender, and tended the brake at that end. The fireman tended the forward brake.

22. Cross. Then you never heard of a double-acting brake while you were on the Camden and Amboy road, from 1842 to 1846, and never heard the subject discussed among the men?

968 A. No, sir; I think not.

23. Cross. And that is why you are sure there was no such brake there, is it not?

A. It is.

24. Cross. When you say, then, that the Tyler car had single brakes on it, you simply mean that you never heard of its having a double brake, do you not?

A. No, sir; I never heard of its having a double brake. Understand me; I mean that a single brake acts only on one truck; a double brake acts on both trucks, from either end.

25. Cross. When did you first hear of a double brake; and who from?

A. One on the New Jersey road, about the time Hackensack Bridge was burnt, about 1851 or 1852. I saw it and heard of it there from the engineers on the New Jersey road. We went and examined the car, or the brakes, at the same time.

26. Cross. Who was reputed to be the inventor of that brake?

A. It was called the Tanner brake.

27. Cross. Who called it the Tanner brake?

A. M'r Baker.

28. Cross. When did you first hear of the Hodge brake; was it before or after you saw the Tanner brake?

A. It was after; it was a short time after. I could not state the time exactly.

29. Cross. Where did you first see the Hodge brake on a car?

A. In the Jersey City depot, on the Tyler car.

30. Cross. Was this the first time you had ever heard of the Hodge brake?

A. Yes, sir.

31. Cross. Did you hear or have much discussion among men engaged in operating railroad trains as to the advantages and disadvantages between single and double brakes, at and about the time you say you first saw the Tanner and Hodge brakes?

A. Yes, sir.

969 32. Cross. Did the brakemen and others all agree that a double brake was preferable to a single brake for holding a train?

A. They did; that a double brake would hold up a train quicker.

33. Cross. In what respect was it claimed that a double brake would hold up a train quicker?

A. One man could attend to two cars or the brakes.

34. Cross. Then it took less men to apply the double than the single brakes?

A. Yes, sir.

35. Cross. If the single brakes were all set, would they not hold the train as well as the double ones?

A. Yes; but it would take double the amount of men to do it, which they never had on railroads at that time; they had two brakemen on a train only.

36. Cross. Do you know Edwin Lockwood, master car-builder on the Camden and Amboy Railroad?

A. I do.

37. Cross. You say the Tyler car was built or rebuilt under his supervision. Would he not know better than yourself what kind of brakes were put on said car?

A. I do not know that he would. I saw it when it came out of the shop, and saw it afterwards.

38. Cross. When did you first hear it claimed or asserted that the Tyler car had a double brake; at the time it came out?

A. I do not recollect that I ever heard of it. I knew when it came out that it had a single brake on each end of the car. I rode on it from the shop to Bordentown, about a mile, when it came out of the shop.

39. Cross. Then you think that you know better what kind of brakes were on the car than M'r Lockwood does, do you?

A. Well, I say that when it came out it had only a single operating brake, that operated at each end of the platform.

40. Cross. Did not M'r Sayles inform you, or give you to understand, before you were called upon to testify here, that some person or persons had sworn that the Tyler car had a double brake when it came out? 970

A. No, sir.

41. Cross. Then the question as to what kind of brakes the Tyler car had at the time it came out, had never been discussed between yourself and M'r Sayles, or between yourself and any other person, up to the time you sat down here to give this deposition?

(Objected to, as the witness has not said anything of the kind.)

A. Well, M'r Sayles came to my house Wednesday, and asked me if I knew or recollected (recollected, I think it was) if I knew the Tyler car. I told him I did. He then asked if I knew what kind of brakes were on. I told him it was a single-operating brake, which operated from each end of the platform. Then he asked me if I knew what time the brakes was changed. I said they were not changed while I was on the road, up to 1846. That was all that passed between us concerning the brakes.

42. Cross. When do you say the Tyler car came out of the shop?

A. It was in 1843; I could not state the day.

43. Cross. Can you state the month?

A. Well, I can come pretty near to it. The car came out just before the Bunker Hill Monument celebration, a few days before, and carried M'r Tyler over the road to that celebration.

44. Cross. And your attention as to what kind of brakes it had at that time has never been particularly called until your conversation with M'r Sayles last Wednesday?

A. Not since I left the road. It was to our benefit to look after the brakes, while I was on the road.

45. Cross. Was the brakes upon the Tyler car a frequent subject of discussion while you remained on that road?

971 A. Not any more than any of the rest of the cars; it was taken more notice of being a nice car, and a six-wheel truck, and noticed more than any other car.

46. Cross. By whom was it noticed more than any other car?

A. By the men on the road, by its having this six-wheel truck—to see whether it wore any more on the road by having the six-wheel truck.

RYNIEAR VANSYCKELL.

Deposition of Aaron H. Palmer.

A. H. PALMER, the next witness, introduced, cautioned and sworn, deposeth and saith:

Int. 1. What is your name, age, residence, and occupation?

A. My name is Aaron H. Palmer; my age is 47 years; Chicago, Ill.; I am in the insurance business.

2. Were you ever employed on the Long Island Railroad? If so, at what time?

A. I was, from 1851 to 1860, with an interval of six months.

3. In what capacity were you so employed?

A. In various capacities; conductor on freight-train; then assistant superintendent, or engaged in the office of the superintendent; then for a year in the president's room, attending to his business for him; then general agent of the road, or acting superintendent, whichever you choose.

4. Do you know what kind of brakes were in use on the cars on that road when you first went there in 1851? If so, please state.

A. I do not know the name of the brake; it was the common brake used to brake up the cars.

972 5. Please state if you know how the brakes that were on the passenger cars of that road operated; whether the brakes were applied on all the wheels of the car from either end or not.

A. They were operated the same as any other brake by winding up; but they did not work at both ends at the same time. They were single-acting and applied to one set of trucks; a double-acting brake applies to both trucks at the same time.

6. Please state, if you know, what kind of brakes were in use on the baggage-cars on that road at the time you went there, whether double-acting or single-acting brakes.

A. My impression is that they were single-acting, except two of the cars; two of them were double-acting. The double-acting brake was applied from the inside of the car by a wheel, the chain coming up and revolving; this acted on both trucks at the same time under the car.

7. Please state, if you know, what kind of brakes were used on the eight-wheel freight-cars on that road.

A. Single-acting; generally applied to but one truck.

8. Is there any circumstance that occurred while you were on the road by which you particularly recollect about the brakes that were used on that road? If so, please state it.

A. There is, which was: I saw the inconvenience which the passengers were often subjected to from the brakemen running through the car to apply the brake upon the other end, and being in the baggage car with M'r Conklin when the double-acting brake was applied, I desired to know why they were not applied to the passenger-cars; his reply was that they would soon have them on them. M'r Conklin was the general agent of the road, or superintendent, at this time; it was in the year 1851 or the first of 1852.

Cross-examination:

1. Cross. Please describe a double-acting baggage-car brake, which you have referred to; and who was its inventor, if you know?

973 A. I did not examine it sufficiently to give a mechanical description of its working; I only know that it set its brakes on both trucks from one windlass on the inside of the car. I do not know the inventor of it.

A. H. PALMER.

Deposition of Francis A. Stevens.

Francis A. Stevens, the next witness, of lawful age, being first cautioned and sworn, deposeth and saith and follows:

Int. 1. What is your name, age, residence, and occupation?

A. My name is Francis A. Stevens; my age is 43 years; I reside in Chicago, Ill.; real-estate operator, and in patent rights.

2. Are you the inventor and patentee of what is known as the Stevens double-acting or equalizing car-brake?

A. I am.

3. Have you at any time had occasion to look up testimony for the purpose of defeating what is known as the Tanner patent for double-acting car brakes, and the Hodge patent for car brakes; if so, when?

A. I have; it was previous to 1854. I made a good deal of inquiry; principally between 1852 and 1854.

4. Do you know Joseph F. Talson, of New Jersey?

A. I did.

5. Have you seen him with regard to double brakes; if so, when, and what did he say to you with regard to double-acting car-brakes?

(Objected to by H. W. Blodget for defence.)

A. I have seen him during the year 1852 or previous to 1854—between the years 1852 and 1854. He said that he had applied a double brake on the New Jersey Railroad and Transportation Company about, I should think, in 1842 or 1843; at any rate it was several years 974 prior to Hodge or Tanner's patent. I think he was not quite clear about the construction of the brake, but finally decided that it was substantially the same as the Tanner brake; it was, or he applied it to one car; that car got broken up, or the brake got broken up, I cannot state which, and was only used for one or two trips. That was all the information I got from him about double brakes.

6. Did you ever visit the Camden and Amboy Railroad with regard to double brakes; if so, when?

A. I did, during the time of the spring of 1852, and up to 1854, several times.

7. Did you see the officers of that road? If so, whom?

A. I did see them. M'r Van Rensselaer, the superintendent, and M'r Lockwood, the foreman of the car department.

8. What was your object in calling upon them the different times you speak of?

A. It was principally to introduce and sell to them my patent brake; that is, the first interviews. I cannot state that I went to them exclusively to ascertain about the prior use of what was called the Tanner brake, but I did make it almost exclusive business at one time to ascertain if there had been at any time a double brake used prior to the Tanner and Hodge patent; this inquiry was general of all the railroad men in that section of the country. I did not find that any double-acting brake had been used, except this one Talson applied, and one that was applied by Ross Winans on some tenders which were then in use on the New York and Erie Railroad.

9. Whom did you talk with about these double brakes on the Camden and Amboy road, and when was it?

A. I talked with M'r Lockwood and M'r Van Rensselaer, at Bordentown, New Jersey.

10. Was there any suit pending at this time for which you was making inquiries about the prior use of the double brakes? If so, what suit?

975 A. There was. Tanner against the Hudson River Railroad.

11. Were you, or were you not, requested by the officers of the said Hudson River Railroad Company to look up testimony in that case; and, if so, by whom, and for what purpose?

A. I was, by M'r North, then secretary of the Hudson River Railroad Company, for the purpose of defeating the Tanner patent.

12. Did you inform M'r Van Rensselaer and M'r Lockwood, of the Camden and Amboy Railroad, of your object in making inquiries of the prior use of the double-acting brake?

(Objected to by counsel for defence.)

A. My inquiry was general. I cannot state the conversation particularly, in reference to that, with those parties. I had a great deal of conversation with M'r Lockwood, and if the double brake had been used I should certainly have known it.

(Objected to as irresponsive, and no foundation laid for the answer.)

Why I answered in that way. I had a great many conversations with railroad men about that time in regard to the prior use of the double brake, but I cannot fix in my mind any particular conversation with these gentlemen.

13. What, if anything, did you learn from M'r Van Rensselaer, or M'r Lockwood, about the use of double brakes on the Camden and Amboy road?

(Objected to by counsel for defence.)

A. I know that they were familiar with the Hodge and Tanner brakes,
and we had a good deal of discussion as to the respective merits
976 of the brakes, mine included; the introduction of those brakes
were of recent date on that road, as the cars were only partially
supplied with double brakes. My object was, when they should decide
upon which was the best brakes, that they would probably adopt my
own. I might rather say it was to persuade them to adopt my own.

14. What brakes did you see in use on the Camden and Amboy road

when you first went to Bordentown, as you state, in the spring of 1852 to 1854? I mean on the passenger trains.

A. My impression is they were mostly single brakes which were then used. I think some of the Tanner brakes were in use, and my impression is they were using some of the Hodge brake, but am not positive. I know they were familiar with the Hodge brake.

15. Did you learn from M'r Lockwood, or M'r Van Rensselaer, at how early a date they had used a double-acting brake on their cars?

(Objected to by counsel for defence.)

A. I do not know that I can remember the date they gave me, if any. In my general inquiry in regard to the use of the double brake, on account of the suit Tanner vs. The Hudson River Railroad, I am satisfied that the Tanner brake was not in use prior to the patent, except the ones I have mentioned heretofore—the Talson brake and the Winans brake—that is, that came under my investigation.

(Answer objected to of all after the words commencing and including the words, "in my general inquiry," &c., on the second line of this page.)

16. Did or did not M'r Lockwood tell you that he had used the double brake on their cars before 1848 or 1849?

A. He did not tell me so.

977 17. After seeing M'r Lockwood and M'r Van Rensselaer, did you report to M'r North, of the Hudson River Railroad? If so, what did you report to him about the use of the double brake?

(Objected to by counsel for defence.)

A. I do not remember that I made any report to him about my seeing them.

18. Did you have consultations with M'r North with regard to your looking up testimony to defeat the Tanner patent? If so, when?

(Objected to by counsel for defence.)

A. I did at the time the suit was pending.

Cross-examined:

1. Cross. Did M'r North, or the Hudson road, retain or employ and pay you for looking up testimony to enable them to defeat the Tanner patent, or did you only act in that matter because you thought your interest in your brake would be promoted by defeating Tanner?

A. They did not retain, nor employ, nor pay me, but requested me. I had more interest, or I considered it more for my own interest, to defeat the broad grounds that Tanner had taken, claiming a patent for operating both brakes by either windlass, without regard to its construction.

2. Cross. Do you still consider it for your interest to defeat the broad ground, as you call it, so taken by Tanner, and the owner of his patent?

A. I look upon it now in a very different way from what I did then. The position that he had taken had defeated, in a great measure, the settlements that I was about making, but now I consider the Tanner brake but of little practical value. The value of my brake over and above the Tanner brake would justify any railroad company in paying me as much for the invention as though the Tanner brake was not in use.

978 3. Cross. Has M'r Sayles, the complainant in this case, any interest in your brake, or have you any interest in the Tanner brake?

A. He has no interest with me in the Stevens brake, nor have I in the Tanner brake.

4. Cross. Has M'r Sayles any interest with M'r Emigh or any other person in the Stevens brake?

A. I do not know as he has with M'r Emigh. I am quite positive he has not. I do not know that he has any interest in the Stevens brake. I am quite positive that no one but M'r Emigh and myself are interested in the Stevens brake.

5. Cross. Please describe the Winans brake which you say you found in use on the New York and Erie road.

A. Attached to the cross-bars of the brakes, or shoes, there were pullies, one pully on each; suspended above these two pullies, and attached to the body of the tender was another groove pully, and the forward trucks were arranged in the same manner. I should have reversed that, and said one pully connected with the shoes, and two suspended from the body of the tender; the forward truck arranged in the same manner. A chain passed over the first suspended pully, down round the pully attached to the shoes, up over the second suspended pully, and through the other pullies of the other truck, in the same manner, and then attached to the windlass; by drawing on the chain it forced or raised up the brake heads between the wheels, but was of very little practical value.

F. A. STEVENS.

CHICAGO, *May 5th*, 1868.

Witness, F. A. STEVENS, recalled, and examined by L. L. Bond, counsel for plaintiff.

979 Int. 1. You have stated that you knew Joseph F. Talson, New Jersey; when did you know him, and what railroad was he connected with, and what position, if any, did he hold?

A. I knew him from 1852 to 1854; he was not connected with any railroad that I know of; he was employed by a rubber company of New York City; I do not know what company employed him.

Int. 2. Do you know whether he had at any time previous to that time been in the employ of any railroad company; if so, of what company?

A. I do not know of my own personal knowledge; I only know from his own personal statement.

Int. 3. Did you during that time, or at any other time, offer said Talson the sum of $50, or other sum of money, to make an affidavit concerning the use of double brakes, which offer said Talson refused to accept?

(Objected to by counsel for defence.)

A. I have no recollection of ever making any offer of the kind.

Int. 4. Would you have been likely to have remembered it, if such offer had been made and refused?

(Objected to by counsel for defence.)

A. I think I would.

Int. 5. Did said Talson, at that time, or any other time, make an affidavit for you, or for any other parties, and deliver to you, concerning the use of said double brakes? If so, what became of it?

A. He did make an affidavit for me, and delivered it to me; I gave it to Capt. Parrot, of Boston; I might have retaken it, and I do not remember what became of it afterwards.

Int. 6. Do you know where that affidavit now is, and whether it can be found or produced?

A. I do not; neither do I know whether it can be found or produced.

980 Int. 7. Do you know whether any efforts have been made to find that affidavit, either by yourself or other parties; and, if so, with what success?

A. I have not tried to find it; other parties have inquired of me concerning it; I have informed them what I have stated here.

Int. 8. Can you remember the words of that affidavit? If you can, please give them; if you cannot, give the substance of the affidavit as fully as you can recollect the same.

(Objected to.)

A. I cannot recollect the identical words; I can give the substance, which was: That he constructed a brake upon one of the cars belonging to the New Jersey Railroad and Transportation Company, the same as the Tanner double brake, about the year 1843; it might have been some earlier or later; I know it was several years prior to the Tanner patent; the brake was used one or two trips; either the car or brake was broken up; that was the end of it.

Int. 9. You have stated that while investigating the subject of brakes from 1852 to 1854, that you thought you saw some cars in use on the Camden and Amboy Railroad which had Tanner brakes on them; were the brakes that you saw simple Tanner brakes, or only part of Tanner brakes?

(Objected to by counsel for defence.)

A. The first brake that I particularly recollect was the Tanner brake, in connection with the bumper brake, or buffer brake; I could not swear positively that I saw the Tanner brake; my impression is that it was there, and I saw it.

Cross-examined:

1. Cross-int. When did you last see the affidavit you have spoken of?

A. About 1853.

981 2. Cross-int. Did you not give said affidavit, or a duplicate of it, to M'r North, of the Hudson River Railroad?

A. I might have done so; I don't remember; I think he saw it.

F. A. STEVENS.

APRIL 18, 1868—11 a. m.

Present, counsel as before.

Examination adjourned to May 6, 1868, at 11 a. m.

Examination further adjourned die in diem to May 18th, at 11 a. m.

M'r Whipple, of counsel for defendant, being present on each of said adjourn days.

MAY 18TH, 1868—11 a. m.

Present, M'r Cozzens, of counsel for complainant, and M'r Whipple, of counsel for defendant, and M'r Sayles, complainant, in person.

Examination further adjourned to May 19th, 1868, at 11 a. m.

MAY 19TH, 1868—11 a. m.

Present, M'r Cozzens, counsel for complainant, and the complainant in person, and M'r Whipple, counsel for defendant.

JEREMIAH COUNSELLOR, a witness produced on the part of the complainant, having been first duly cautioned and sworn, deposes and says as follows:

982 1. Q. What is your name, age, residence, and occupation?

A. My name is Jeremiah Counsellor. I am 49 years of age. I reside at Newark, New Jersey. I am manager of the New Jersey Mutual Life-Insurance Company.

2. Q. Were you ever in the employ of any railroad company or companies? If so, what ones?

A. I was. In the Morris and Essex Railroad Company, and in the New Jersey Railroad and Transportation Company.

3. Q. How long were you in the employ of those companies?

A. From the summer of 1845 to 1865 in the summer.

4. Q. Were you in the employ of those two companies at the same time? Please explain how you were employed by them.

A. I was employed by the Morris and Essex Railroad Company first, for about a year and a half or two years. In the summer of 1847 the New Jersey Railroad and Transportation Company employed me to go to Rahway on their road.

5. Q. Then did you continue in the employment of the New Jersey Railroad and Transportation Company from 1847 to 1865?

A. Yes, sir.

6. Q. In what capacity or capacities were you employed by the New Jersey Railroad and Transportation Company during this period?

A. As passenger conductor, or passenger and freight conductor; we ran both.

7. Q. Do you remember when double-acting car-brakes acting on both trucks, from either end of the car, were first introduced on the cars of the New Jersey Railroad? If so, when was it?

A. I do. It was in 1851, by M'r Baker, foreman of the repair shop.

8. Q. What sort of brakes had been in use on the New Jersey Railroad cars prior to that time?

A. The old-fashioned brake acting on one truck only.

983 9. Q. Will you describe generally the construction of the double-acting brake applied by Baker in 1851?

A. It was a single-lever double-acting brake, acting on all the trucks at the same time; the single lever was underneath the car.

10. Q. Prior to the time when M'r Baker introduced this double-acting brake on the New Jersey Railroad, could there have been any double-acting brakes used on the cars of that road, for any length of time, without your knowing of it?

A. No.

11. Q. Did you ever know of a car on the Camden and Amboy Railroad called the Tyler car?

A. I did.

12. Q. For about how long did you know of that car?

A. As early as 1847, I think. I think I kept the run of it until about 1858, or just before the war broke out. I do not recollect the exact year.

13. Q. During this period did you see that car and notice it pretty often?

A. I did.

14. Q. Can you state any peculiarities in its fittings up? If so, what?

A. There was a privy platform, and the seats differed from those of other cars.

15. Q. When you first knew of this car in 1847, what kind of brakes did it have?

A. It had the old-fashioned brake operating on a single truck.

16. Q. For about how long did that Tyler car continue to have this old-fashioned brake operating upon a single truck?

A. Until not earlier than 1851, about the time that M'r Baker put the one on the New Jersey car.

17. Q. When this Tyler car ceased to have the old-fashioned single

brake upon it, about the time that Baker put his brake upon the New Jersey Railroad car, as you have stated, what kind of brake did it have on it?

A. It had a brake with two levers, which they called the Hodge brake.

984 18. Q. Was it a double-acting brake, that is, acting on both trucks from one windlass?

(Question objected to, as instructing the witness; question withdrawn.)

19. Q. Upon how many trucks of the car did this brake with the two levers act?

(Question objected to for same reason.)

A. It acted on the two trucks at the same time, I believe.

20. Q. Was this Hodge brake put upon the Tyler car before or after Baker put his brake on the New Jersey Railroad car?

A. I think that it was about the same time.

21. Q. Was there any discussion among the railroad employees about these two brakes; and, if so, what was it?

A. There was; the men seemed to prefer that of M'r Baker.

22. Q. Do you remember any accident on the New Jersey Railroad when you were on the train; and, if so, what was the accident, and what leads you to remember it?

A. I do. In October, 1852, at Jersey City, the locomotive ran off the track, and I used one of those brakes of M'r Baker's myself, which was on a passenger and baggage car. I remember it because I lost my fingers and broke my legs through the accident, there being no ratchet to the brake, which I held on to as we were going down the grade. There was no ratchet on the windlass on that car; the brakeman jumped off, and I caught hold of the brake and held it myself; had there been a ratchet I could have locked the brake and jumped off myself; my fingers were broken between the railings of the car ahead of me and the brake-wheel.

23. Q. About how long was this accident after double brakes were first introduced on the New Jersey road?

985 A. About one year, I think.

24. Q. About how long was it, after you first saw a double brake of any kind?

A. Not over a year.

25. Q. What was the first double brake that you ever saw?

A. I am not positive whether it was the one M'r Baker first put upon our car, or the one on the Tyler car; it was one or the other. I never heard of any before.

26. Q. While you were in the employ of the New Jersey Railroad and Transportation Company, did other cars of the Camden and Amboy Railroad, besides the Tyler car, come into Jersey City; and, if so, about how often?

A. They did. Trains were coming in from Philadelphia, over their road, as often as twice a day.

27. Q. Before about the time that the double brake was put on the Tyler car, as you have stated, what kind of brakes were used on the passenger and crate cars of the Camden and Amboy road, which came into Jersey City?

A. The old-fashioned brake, acting on a single truck.

28. Q. Before the time this double brake was put on the Tyler car, could there have been any brake acting on both trucks from one wind-

lass used on any of these other Camden and Amboy cars, for any length of time, and you not have known it ?

A. I think not; there could not on any that came over our road.

29. Q. How positive do you feel about this, as to those of their cars that came over your road ?

A. They could not have come there unless I had seen them, or heard of it, because in those days conductors acted as brakemen part of the time; we had but one brakeman, and the conductor had to aid him in stopping the cars when they got to a station.

And being cross-examined by M'r Whipple, of counsel for defendant, he deposes and says:

1. Cross-q. Do you know what brakes were in use on the Tyler car in the years 1843, 1844, and 1845 ?

986 A. No, sir.

2. Cross-q. Do you know Edwin Lockwood, who had charge of the car department of the Camden and Amboy road.

A. No, sir.

3. Cross-q. Did you ever see him ?

A. I am not aware that I ever did; I might have.

4. Cross-q. Do you know William Coulter, conductor on the New Jersey Railroad and Transportation Company's road ?

A. I do.

5. Cross-q. When he states in his evidence taken in this case that there was a double-acting brake with one lever under the body of the car, as you have described, in use on the Tyler car prior to 1847, does he state truly ?

A. I am not able to say in regard to M'r Coulter what he saw.

6. Cross-q. Do you know James S. Gamble, and was he formerly conductor on the New Jersey Railroad and Transportation Company's road ?

A. I do know him, and he was formerly conductor on that road ?

7. Cross-q. Would he be likely to know whether there was such a double brake as you have described in use on a car of the New Jersey Railroad and Transportation Company prior to 1847 ?

A. I think he would prior to 1846; I forget whether he left us in 1846 or 1847. He went over the road twice a day.

8. Cross-q. May there not have come over the New Jersey Railroad and Transportation Company's road a crate-car with a double-acting centre-lever brake on it, belonging to the Camden and Amboy road, prior to 1850, without your knowing it ? If not, explain why.

A. I am satisfied in my mind that there could not have been, because I was daily on the road, and in contact with Camden and Amboy baggage-masters and conductors and brakemen.

987 9. Cross-q. Did you personally inspect all the cars of the Camden and Amboy Railroad Company which came to Jersey City from time to time to see what brakes were in use on those cars ?

A. I did not. I was not hired for that purpose.

10. Cross-q. In answer to the 22d direct interrogatory, you speak of an accident which occurred in October, 1852, and that, in consequence of there being no ratchet on the shaft of the windlass wheel, you had your fingers cut off in holding on to the wheel while trying to stop the train. Was it a usual thing on the cars of that road that no pawl and ratchet were in use on the brake-staff of the cars ?

A. There were none attached to the staff, I think, but on very few of the cars; there was a hole in which we put the pin attached to the

ratchet to hold the brake, and it was taken out when we got to the depot. This was to prevent persons from annoying us by stopping the cars and locking the brakes.

11. Cross-q. Was there a pawl and ratchet thereafter applied to the staff of the cars for the purpose of holding the power of the brakeman when he applied the brakes to a car?

A. I think it has been generally adopted since.

12. Cross-q. Is it or not harder work for a brakeman to hold a car with the brakes with or without a pawl and ratchet on the windlass-staff?

A. It is harder without. With the ratchet he can attend to two or three cars by passing through.

13. Cross-q. Then prior to this accident, as a general thing, the brakeman was obliged to hold the wheel in his hand while the brake was being applied?

A. If he chose to use one of those pocket ratchets that he carried he would not.

14. Cross-q. Did you have one at the time of the accident.

A. No.

15. Cross-q. Which is hardest on the brakeman, the operation of a double brake applying the power to two trucks or one truck, in case there is no pawl and ratchet on the brake-staff?

988 A. I do not believe there is much difference, for he could slide the wheels with either. I have worked harder to stop the train with a single brake than with a double brake.

16. Cross-q. Is it harder to apply the same amount of power to two trucks than to one truck at the same time in stopping a car where there is no pawl and ratchet on the staff or not? What is your opinion?

A. I do not believe it would make much difference, as you gain your power by the double leverage.

17. Cross-q. Is there any leverage given to the double-acting centre-lever brake, as put on by Baker, to the brakeman in applying the brake to the wheels of a car?

A. You get more power with less effort.

18. Cross-q. Was there a pawl and ratchet wheel or not applied to the brake-staff of the cars of the Camden and Amboy road that came to Jersey City prior to 1852?

A. I think theirs worked the same as ours; I am not positive about that.

18. Cross-q. Was there or not a pawl and ratchet on the windlass-staff of the Tyler car?

A. I do not recollect. There might have been and there might not have been. I cannot say.

20. Cross-q. How often should you judge the Tyler car came to Jersey City prior to 1852?

A. I should think as often as once a week; it might have been three times a week.

21. Cross-q. Did it run regularly from the time you knew it, as you say, in 1846 and 1847 to 1852?

A. I think it did, except when it went into the shop for repairs as other cars did.

22. Cross-q. You are quite sure of this are you?

A. I saw it frequently, which makes me feel sure of it.

And being re-examined by M'r Cozzens, he deposes and says as follows:

1. Redirect q. You have been asked in reference to M'r Coulter,
989 and I will therefore in that connection put this question to you:
Would the crank on the windlass-staff be as likely to fly back and strike a person in the single brake as in the double brake?

A. It would; not, however, with so much force, because the greater the power the greater the blow. I had a man who had his arm broke at Rahway by a blow from the windlass-crank of a single brake in 1846 or 1847. I think there was a pocket-ratchet on the staff that he used, but it got loose in some way, and the crank flew around and broke his arm.

And being further cross-examined by M'r Whipple, he deposes and says as follows:

1. Recross-q. Would the same reaction take place on a double brake, and with greater or less power?

A. It would, and with greater power.

J. COUNSELLOR.

Subscribed and sworn to before me this 19th day of May, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to May 22d, 1868, at 11 a. m.

MAY 22D, 1868—11 a. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

Examination adjourned to May 23, 1868, at 11 a. m., at the office of M'r Gifford, No. 34 Beach street, in the city of New York.

990 NEW YORK, *May 23d*, 1868—11 a. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

GEORGE GIFFORD, a witness of lawful age, produced on the part of the complainant, having been duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and profession?

A. My name is George Gifford; I am fifty years of age, and upwards; reside at Bergen, Hudson County, New Jersey, and am a lawyer doing business in the city of New York.

2. Q. Were you ever retained as counsel for the defence in a suit brought upon the patent for the so-called Tanner double-acting car brake which is in controversy in this cause? If so, what suit was it?

A. I was, and it was a suit against the Hudson River Railroad Company.

3. Q. Do you remember in what year that suit was pending?

A. It was in or about the year 1853.

4. Q. State what was the line of defense which the defendants in that case sought to establish?

A. It was to find a prior use of the invention patented by the patent on which the suit was brought.

5. Q. In the course of the preparation of that case for the defense, did you consult with any counsel or witnesses? If so, with whom?

A. I did; I consulted with M'r Thomas M. North, who was then

ratchet to hold the brake, and it was taken out when we got to the depot. This was to prevent persons from annoying us by stopping the cars and locking the brakes.

11. Cross-q. Was there a pawl and ratchet thereafter applied to the staff of the cars for the purpose of holding the power of the brakeman when he applied the brakes to a car?

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18. Cross-q. Was there or not a pawl and ratchet on the windlass-staff of the Tyler car?

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20. Cross-q. How often should you judge the Tyler car came to Jersey City prior to 1852?

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1. Q. What is your name, age, residence, and profession?

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A. It was in or about the year 1853.

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5. Q. In the course of the preparation of that case for the defense, did you consult with any counsel or witnesses? If so, with whom?

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GEORGE GIFFORD, a witness of lawful age, produced on the part of the complainant, having been duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and profession?

A. My name is George Gifford; I am fifty years of age, and upwards; reside at Bergen, Hudson County, New Jersey, and am a lawyer doing business in the city of New York.

2. Q. Were you ever retained as counsel for the defence in a suit brought upon the patent for the so-called Tanner double-acting car brake which is in controversy in this cause? If so, what suit was it?

A. I was, and it was a suit against the Hudson River Railroad Company.

3. Q. Do you remember in what year that suit was pending?

A. It was in or about the year 1853.

4. Q. State what was the line of defense which the defendants in that case sought to establish?

A. It was to find a prior use of the invention patented by the patent on which the suit was brought.

5. Q. In the course of the preparation of that case for the defense, did you consult with any counsel or witnesses? If so, with whom?

A. I did; I consulted with M'r Thomas M. North, who was then

attorney of the Hudson River Railroad Company, also with M'r William W. Hubbell, then of Philadelphia, as one of the counsel, and with Joseph F. Talson, as a witness, and with some others whose names I do not now recollect.

6. Q. Please state, as nearly as you can remember, what information you obtained from Talson, in relation to said matter.

991 A. I obtained from M'r Talson information of an experiment having been tried on a car of the New Jersey Railroad with what he called the Stanley brake, which consisted of an attempt to use it as directed by Stanley, and a subsequent attempt of M'r Talson to use it as he thought best, and that the use of it was then given up and discontinued. I also obtained from M'r Talson information that such attempted use was not satisfactory—was very limited—and that no subsequent attempt to use it was made by him or within his knowledge.

7. Q. Was this all which Talson communicated to you in relation to the subject of the use of double-acting car brakes prior to the invention in reference to which the suit was brought?

A. It was.

8. Q. Did he profess to know anything on the subject of such prior use of double-acting car brakes except what he so communicated to you?

A. He did not. On the contrary, being very anxious to find subject-matter of defense to the suit, we used all the means (M'r North and mysel) at our command to ascertain from M'r Talson all that he knew which would in any way aid us in proving the use or existence of a double-acting brake prior to the alleged invention of the Tanner brake, and all we could get from M'r Talson upon that subject was information of the above-mentioned experiments with the so-called Stanley brake.

9. Q. Was Talson ready and willing to communicate what information he professed to have on the subject of double-acting brakes?

A. He appeared to be, and very anxious to aid us in finding matter of defence.

10. Q. I will call you attention to one or two specific matters, although the subject has been already covered generally by your previous answers, and I will ask you whether, in any of your consultations with Talson in reference to said suit, he said anything about the use, prior
to the invention of the Tanner brake, of a double-acting brake
992 upon a car called the "Tyler car," upon the Camden and Amboy
Company's railroad or upon any other car or cars of said Camden and Amboy Company?

A. He did not.

11. Q. Did he say anything about the use of any such brake upon any car or cars of the Long Island Railroad Company?

A. He did not.

12. Q. How full and thorough was the investigation made by the defendants in that case of the use of car brakes prior to the invention of the Tanner brake?

A. It was very full and very thorough, so far as I was concerned. I depended chiefly upon M'r North to find the witnesses or proposed witnesses, and in case that he came to the conclusion that they knew anything on the subject, desirable to prove as a defense, to bring them to me at my office, so that I could personally ascertain directly from them what they knew. I believe that M'r North made a very thorough search for any prior use of such brake, for I know that he appeared to be very anxious to find a reliable defense, and that I advised him repeatedly that to do so he would have to find a prior use of the invention. M'r

North did bring persons to me, and among them was M'r Talson, and the names of others I do not recollect. I do remember that M'r Talson was one, because at first we placed considerable reliance upon what he said of the trial of the Stanley brake, and subjected it to a thorough examination, and came to the conclusion that it was merely an abandoned experiment, and worth nothing as a defense.

13. Q. Please state any circumstances within your knowledge which made it specially important to succeed in finding a defense in the said suit.

A. There was no circumstance peculiar to that suit of that kind, except that there was a suit also on the same patent against the Erie Railroad, in which other counsel appeared for the defendants, and it being understood that the Erie road was to co-operate with the Hudson River road in defending against the patent, and that the suit against the Hudson River road would probably be first tried; this circumstance, 993 in connection with the fact that I had reason to believe that both companies depended very much upon me, caused me to feel particularly desirous of finding reliable matter of defense. This also stimulated me to make a very close examination of any proposed matter of defense to avoid making any mistakes about it.

14. Q. Was it considered by you that all the information and facts existing in respect to the railroads of the State of New Jersey relative to the use of double-acting brakes prior to the Tanner brake was obtained in this Hudson River Railroad suit?

A. It certainly was; and it was so understood between me, M'r North, and M'r Talson, so far as I know or have any reason to believe.

15. Q. After the investigation and preparation in said case was completed, what conclusion did you and the other counsel come to as to their being a defense to the action?

A. I came to the conclusion that we had nothing on which we could successfully defend. I then caused M'r Hubbell to come to my office and to have M'r North present, and I then and there stated to M'r Hubbell fully and fairly what matters of defense we had been able to find, and requested him to say whether he thought they were sufficiently reliable to risk a trial on, and he agreed with me that they were not. After which I advised M'r North to settle the suit on as easy terms as he could.

(So much of the answer as states what M'r Hubbell thought objected to by M'r Whipple.)

16. Q. Were you engaged as counsel in a suit tried at Canandaigua in or about 1859, upon the Hodge patent, and did you take part in the trial of said case?

A. I was, and acted as counsel for the defendants.

17. Q. Do you remember who were the defendants in that case?

A. The New York Central Railroad Company, according to my best recollection.

994 18. Q. Do you know Henry Waterman, of Hudson, New York, and was he a witness on the part of the defense in that case?

A. Yes; and he was such witness.

19. Q. Will you state what was the line of defense adopted in that case?

A. One, and a leading one, was that the Hodge improvement was not useful in view of what preceded it, and that the Hodge patent contained false suggestions or misrepresentations respecting the alleged utility of the thing he had patented. There were other matters of defense, but I do not remember them sufficiently to enumerate them. In my summing up of the case I made the subject of non-utility my leading point.

20. Q. Was any witness present at that trial from any other railroad; and if so, what railroad?

A. There was; from the Camden and Amboy Railroad.

21. Q. Please state what this witness was called for.

A. This witness was called on the part of the defendants to prove the results of a comparison between the use of the Hodge brake and another brake, which, according to my best recollection, was the Tanner brake.

And being cross-examined by Mr. Whipple, he deposes and says:

1. Cross-q. Are you retained as counsel for any party or parties interested in this Tanner patent?

A. I am retained with Mr. Cozzens in favor of the Tanner patent, and I suppose that it is by parties interested in it.

And being re-examined by Mr. Cozzens, he deposes and says:

1. Redirect q. Were you ever retained in favor of the Tanner patent by Mr. Sayles, the complainant in this case?

A. I was not; nor by any one else in favor of it until after the extension.

995 2. Redirect q. Was the retainer you speak of on behalf of M'r Mowry, the trustee of the extended term?

A. I so understand it.

And being further cross-examined by Mr. Whipple, he deposes and says:

1. Recross-q. Have you been consulted by Mr. Cozzens or any other person or persons in relation to the evidence or anything else connected with this case?

A. M'r Cozzens has conversed with me respecting what matters of defense we found in the suit against the Hudson River Railroad Company, and as to what conclusions the counsel for the defendants in that case came to thereon. I do not now remember that he has talked with me about anything else connected with this case or that he could have been said to consult me in the case at all. What has occurred has been more like matters of inquiry than anything else.

2. Recross-q. Do you understand by the Tanner brake a brake with a centre or cross lever under the body of the car by which the brakes of both trucks are operated from either end?

A. I understand that the Tanner brake would do that, but the particulars about it I do not now remember.

3. Recross-q. Has the Tanner brake a centre lever attached under the body of the car equidistant or thereabouts between the trucks or not?

A. I don't remember.

4. Recross-q. In your answer to the 21st direct interrogatory you say, "This witness was called on the part of the defendant to prove the result of a comparison between the use of the Hodge brake and another brake, which, according to my best recollection, was the Tanner brake." Please describe what you call the Tanner brake.

A. I do not now sufficiently remember the particulars of it to be able to describe it with certainty.

5. Recross-q. Was it a double-acting brake? If so, what kind of a double-acting brake?

996 A. According to my best recollection it was a double-acting brake. That I am quite certain of; and according to my best

recollection it had what was called a centre lever to connect rods to, but how those connections were arranged and made I do not now remember at all.

6. Recross-q. Wherein did this centre lever differ from the Hodge brake with which it was compared in the trial of the aforesaid case at Canandaigua?

A. That I do not remember, but it seems to me that one of them had a centre lever attached to something under the car body as a fulcrum, and that the other had not such attachment.

7. Recross-q. What was the result of the trial of said Hodge with the New York Central Railroad Company?

A. There was a verdict for the plaintiff, and I think of $1,500.

GEO. GIFFORD.

Subscribed and sworn to before me this 23d day of May, 1868.

JOSEPH GUTMAN, JR.,
Examiner, &c.

Examination adjourned to May 27th, 1868, at 11 a. m., at the office of M'r Cozzens, No. 7 Warren street, in the city of New York.

997 In the circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.
} In equity.

Testimony taken on the part of complainant before William Grier Hibble, United States commissioner and examiner, in the city of Philadelphia, under the rules of the Supreme Court of the United States.

MAY 25TH, 1868.

Present, Mr. S. D. Cozzens for complainant, and the complainant in person; Mr. S. M. Whipple for respondents.

ISAAC W. VAN HOUTEN, being duly sworn, deposes and says:

1. Question. What is your name, age, residence, and occupation?

Answer. My name is Isaac W. Van Houton; aged fifty-four years, about; reside in the city of Philadelphia, Pennsylvania; by occupation general overseer of the car department for Pennsylvania Railroad Company.

2. Question. How long have you been employed in that capacity by said company?

998 Answer. About two years in that capacity, and in other capacities, for the same company, nearly eighteen years. Up to the time I was employed in my present position I had charge of the company's shops (car-shops) at Philadelphia.

3. Question. Were you ever in the employ of the New Jersey Railroad and Transportation Company? If so, in about what year did you go into their employment?

Answer. I was in their employment. I think I commenced working for them in 1843.

4. Question. In what year did you leave their employment?

Answer. In the spring of 1850.

5. Question. While in their employment, did you w ular kind of shop; and, if so, what kind of shop?

Answer. I was employed in their car-shop.

6. Question. What kind of work did you do in this car-shop?

Answer. I helped to do all kinds of work that came there; building and repairs of cars, &c.

7. Question. Did this work include the building and applying and repairing of the trucks, running gear, and brakes of the cars?

Answer. It did.

8. Q. Are you familiar with the construction and operation of what are called single-acting car-brakes, operating upon only one truck at a time?

Answer. I am.

9. Question. Are you familiar with the construction and operation of double-acting brakes for railroad cars?

Answer. I am.

10. Question. During the time you were in the employ of the New Jersey Railroad and Transportation Company, what kind of brakes, whether single or double-acting, were used upon the passenger and crate cars of said company?

Answer. Single-acting brakes.

11. Question. Do you remember how many crate-cars were in use by said company during the time you were in its employ? If so, how many?

999 Answer. I can't say definitely how many; eight or more that carried those crates; we had a large number of flat cars, or platform-cars.

12. Question. About how frequently did your duties on said N. J. road lead you to see and examine its cars during the time you were in its employ?

Answer. Well, we had to do with the cars in some shape or other every day. The cars that were running daily in the passenger-trains we only done repairs to on the track when our attention was called to them by the yard-man.

13. Question. About how often did these cars need such repairs?

Answer. Sometimes we would go out every day, and again sometimes we would not go out for three or four days.

14. Question. Did the repairs which, as you testify, you did to the cars on said railroad require you to see the brakes which were on said cars?

Answer. They did.

15. Question. Could there have been any double-acting brakes used for any length of time on any of the cars of the said N. J. Railroad while you were in its employ, without your knowing it?

Answer. I don't think there could. There could have been, but I don't think there was. It is possible to do a good many things.

16. Question. During the time that you were in the employ of the said railroad, did any cars belonging to the Camden and Amboy R. R. Co. run over said N. J. Railroad to Jersey City?

Answer. Yes.

17. Question. About how many of such cars?

Answer. Probably some days a dozen would come to Jersey City. I think they would average a dozen cars a day—passenger-cars.

18. Question. Did you, while in said N. J. Railroad Co.'s employ, have to do repairs on these Camdem and Amboy R. R. cars?

Answer. Yes.

1000 19. Question. Upon what parts of the cars were these repairs?
Answer. Both on the trucks and body.

20. Question. When you repaired them on the trucks, did you see the brakes of the cars?

Answer. I did.

21. Question. About how often, on an average, were you required to repair these cars on the trucks?

Answer. I don't know that I can average it; probably twice a week.

22. Question. Up to the time you left the employ of said N. J. Railroad Co., in the spring of 1850, what kind of brakes were used on these Camden and Amboy cars which came to Jersey City, as stated?

Answer. Single-acting brakes.

23. Question. When, as nearly as you can state, did you first see a double-acting railroad car-brake?

Answer. I think in 1851, on the Pennsylvania Central Railroad.

24. Question. Had you ever seen one before you left the employ of the New Jersey Railroad?

Answer. I do not now recollect that I did.

Cross-examined by S. M. Whipple:

1. Cross-question. What time in the year 1843 did you enter the employ of the New Jersey Railroad Co.?

Answer. I am not positive whether it was 1843 or 1844, but whichever year it was, it was in the summer months. I recollect now it was in the summer months of 1843. I will answer the question it that way.

2. Cross-question. Were you ever in the employ of the Camden and Amboy R. R. Co.?

Answer. I was not.

3. Cross-question. To what extent were cars belonging to the Camden and Amboy Railroad Company repaired at Jersey City?

Answer. As small an extent as possible, with a view to safety in their running.

1001 4. Cross-question. Do you know what brakes were in use on all the baggage and passenger cars belonging to the Camden and Amboy Railroad during the time you were in the employ of the New Jersey R. R. and Trans. Co.?

Answer. I do not.

5. Cross-question. May there not have been one or more cars belonging to the Camden and Amboy Railroad Co. with a double brake thereon have come to Jersey City without you knowing it while you were in the employ of the New Jersey R. R. and Trans. Co.?

Answer. There may have been.

6. Cross-question. Are you positive that there was no double-acting brake in use on any car or cars in use belonging to the Camden and Amboy R. R. Co. that had not in use on the same a double-acting brake, during the time you were in the employ of said New Jersey R. R. and Trans. Co.?

Answer. I am not positive that there were not any in use.

7. Cross-question. Did you know of a car belonging to the Camden and Amboy R. R. Co. called the John Tyler or Tyler car?

Answer. I knew there was one called the Tyler car.

8. Cross-question. Do you know that there was not a double-acting brake applied to said Tyler car in the summer of 1843?

Answer. I do not know that there was not a double-acting brake applied to said car.

9. Cross-question. Do you know that there was not a double-acting

brake in use on said car during the time you were in the employ of said N. J. R. R. and T. Co.?

Answer. I do not.

10. Cross-question. Do you know that there was not a double-acting brake in use on a crate or flat car belonging to said Camden and Amboy R. R. Co. during the time you were in the employ of said N. J. R. R. and Trans. Co.?

Answer. I do not. If it is a general question, applying to all the crate or flat cars of the company, then I do not know.

1002 11. Cross question. Are you positive that no crate or platform car belonging to said Camden & Amboy Railroad Company with a double brake thereon came to Jersey City while you were employed there?

Answer. I am not positive; there may have been, but I did not see one that I can recollect of.

Re-examined:

25. Question. When you answered the 6th cross question, how did you understand it?

Answer. I understood it to mean any cars belonging to the Camden and Amboy R. R. Co. whenever they were on the road.

26. Question. You have been asked if there may not have been one or more Camden and Amboy cars with double brakes come to Jersey City while you were on the New Jersey road. Do you think any such Camden and Amboy cars could have run to Jersey City for any considerable length of time while you were on the N. J. road without your knowing it?

Answer. I don't think they could have run any considerable length of time without my knowing it, yet it is possible they might have come there without my seeing them.

Recross:

12. Cross-question. Assume that twenty or more witnesses, mostly in the employ of the Camden and Amboy R. R. Co., have testified, in this case, that one or more cars belonging to that company were in use upon that road, with double brakes in use on said cars from June, 1843, to 1852, and onward, are you prepared to say these witnesses are mistaken in giving such testimony, and that these cars, with said double brakes thereon, did not come to Jersey City?

Answer. I am not prepared to say that they were mistaken, 1003 neither am I prepared to give any evidence that such was the fact because they say so, but understand my evidence to be what I know, and not what they say.

13. Cross-question. Do you know that there was no double-acting brake in use upon a passenger car and also upon a platform car belonging to said Camden and Amboy Railroad Co., during the time you were in the employ of the New Jersey R. R. and Trans. Co.?

Answer. I do not answer the question as covering all parts of the Camden and Amboy R. R.

14. Cross-question. Do you know that no such passenger and platform car, with double brakes thereon, did not come to Jersey City while you were employed at that place?

Answer. I do not.

27. (Question by M'r Cozzens.) Could any such passenger car or platform car have come to Jersey City for any considerable length of time while you were employed there without your knowing it?

Answer. I think I answered that question before. I don't think they would have run there without my knowledge; it is possible they may have run a while without my seeing it.

28. Question. Assume what is the fact, that twenty or more witnesses, all either now or formerly in the employ of the Camden and Amboy or New Jersey R. R. Companies, have testified in this case, that to the best of their knowledge and recollection no Camden and Amboy cars came to Jersey City with double brakes until after 1850. Do these statements correspond or not with your recollection of the matter?

Answer. They do correspond with my recollection of the matter; I do not think they came there.

15. (Cross-question by M'r Whipple.) Do you know that a passenger car called the John Tyler, and a platform car for carrying baggage-crates, did not come to Jersey City when the business of the road required it, with double brakes thereon, while you were employed at Jersey City? 1004

Answer. I do not know that they did not come; if they did come, I do not know whether they had double brakes.

29. (Question by M'r Cozzens) Did you see the Tyler car several times?

Answer. I did.

30. Question. Were there any double brakes on it when you saw it?

Answer. I have no recollection of having examined the brakes; it may or may not have had them.

31. Question. Did you repair the Camden and Amboy crate-cars that came to Jersey City while you were employed there?

Answer. I helped to do so.

32. Question. About how frequently?

Answer. I should think once a week.

33. Question. Do you remember seeing double brakes on any of them?

Answer. I do not.

16. (Cross-question by M'r Whipple.) What kind of repairs did you do to these crate-cars of the Camden and Amboy Railroad?

Answer. The general repairs done to those cars were repairing the brakes.

17. Cross-question. At what place was the general repairs of the Camden and Amboy road done?

Answer. Bordentown, N. J.

18. Cross-question. Do you know that a crate-car belonging to said Camden and Amboy R. R. Co., with a double-acting brake thereon, did not come to Jersey City when the business of the road required it?

Answer. I do not know that such a car did not.

1005 34. (Question by M'r Cozzens.) Where were the general repairs to the crate-cars referred to in your 16th cross answer done?

Answer. At Jersey City.

19. (Cross-question by M'r Whipple.) What do you mean by general repairs of brakes at Jersey City when you say the general repairs of the Camden and Amboy R. R. Co. were done at Bordentown? Were or were not all general repairs done at Bordentown?

Answer. I mean to say that the general repairs done to the brakes of those cars when on the N. J. Railroad was done at Jersey City; it was very seldom that any other repairs was done to those cars by the N. J. R. R. Co., and I mean to say that all repairs what is known as general repairs by the company who own the cars is done at such company's general repair shops, and that the general repair shops of the Camden and Amboy R. R. Co. is at Bordentown. I will say further that I think that they consider general repairs as I do to be when a car or cars is so much out of repair as to have to be taken in the shop in order to have such repairs done; trucks, brakes, bodies, or any other parts of the cars.

35. (Question by M'r Cozzens.) What kind of repairs was it that were mostly done at Jersey City by you and the other men there to the crate-cars referred to in your 16th cross-answer?

Answer. Brakes.

(20. Cross-question by M'r Whipple.) Is it not a fact that more repairs are required on brakes of the cars of any road than any other part of the car?

1006 Answer. In small matters of repairs I should think they do. I will say that during the time I was employed on the New Jersey Railroad, the manner in which the brakes were constructed and put on would take more repairs than the brakes on the same number of cars as now constructed would do.

I. W. VAN HOUTEN.

Sworn to and subscribed before me this 25th day of May, A. D. 1868.

W. GRIER HIBLER,
U. S. Commissioner.

Isaac Nostrand, being duly sworn, deposes and says:

1. Question. What is your age, residence, and occupation?

Answer. Fifty years of age; residence, Philadelphia; no occupation at present.

2. Ques. What occupation were you last engaged in?

Ans. I have been stock-dealer and tobacco-broker.

3. Ques. Were you ever employed by the Camden and Amboy R. R. Co.; if so, in what year did you go into their employ?

Ans. Yes, sir; in the year 1848 I went into their employ.

4. Ques. In what capacity were you first employed by them?

Ans. I was employed as a baggage-master.

5. Ques. Did you run upon any train; and, if so, upon what train?

Ans. I did; I ran upon what was called the 9 o'clock train from Philadelphia to New York, by way of Tacony.

6. Ques. About how long did you continue upon that train?

Ans. I do not think it was a year; it might have been near a year.

7. Ques. After you left this train did you take another train of said company; and, if so, what train?

1007 Ans. I was transferred from the 9 o'clock train to what was called the 6 o'clock train, as conductor, running from Philadelphia by way of Camden and Bordentown, to Jersey City.

8. Ques. How long did you continue as conductor on this train?

Ans. It was a year, I suppose; it may be more.

9. Ques. During this time did you know of a car called the Tyler car?

Ans. I did know of such car.

10. Ques. What kind of brakes did this Tyler car have at this time?

Ans. The brakes on the whole train, I believe, were uniform. There was no difference, I believe, between this car and the other cars.

11. Ques. About what year was this time that you speak of?

Ans. I think part of each year 1849 and 1850. I know it was in 1849 that I took charge of the 6 o'clock train.

12. Ques. You say there was no difference between the brakes of this Tyler car and the other cars. I will ask you upon how many wheels the brakes of these cars, including the said Tyler car, operated from one windlass, at this period?

Ans. Upon four wheels, or upon one truck, the truck where the windlass was placed.

13. Ques. Did you have this Tyler car in this 6 o'clock train which you run, as you say, in 1849 and 1850?

Ans. It was a portion of the time. I have had it in other trains.

14. Ques. After you left the 6 o'clock train did you have any other train of said company; if so, what train?

Ans. I was transferred from that to the express-train, which went from Philadelphia to Jersey City, by way of Tacony. I think that at first it left at 9 o'clock, and was afterwards changed to 10 o'clock, by way of Camden.

15. Ques. Was this the same train as the 9 o'clock you have before spoken of, or was it a different train?

Ans. It was the same train.

1008 16. Ques. Did you ever know of double brakes being used on the cars of the Camden and Amboy R. R. Co.; and, if so, about what year did you first know of it?

Ans. I cannot specify the year; it was some time after I left the 6 o'clock train.

17. Ques. Was it before or after the time when you took the 9 o'clock train, which was afterwards changed to the 10 o'clock train?

Ans. It was after.

18. Ques. About how long after?

Ans. I cannot specify the time; it might have been a year.

19. Ques. What year would this make it?

Ans. It would be in the latter part of 1850, or some time in 1851.

20. Ques. What called your attention at this time, in 1850 or 1851, to the subject of double brakes, on the Camden and Amboy cars?

Ans. By hearing the conversation of men connected with the train. My impression was that the brakes operated to better advantage than the old brakes we had been formerly using.

21. Ques. At this time, in 1850 or 1851, what was the effect of the double brakes in respect to stopping trains, as compared with the brakes you had been formerly using?

Ans. The effect was that the trains would be stopped in a shorter space. The engineers could make a better calculation about stopping at the right place. Formerly there was difficulty about running by stations, and we were forced to back up again.

Cross-examined by S. M. Whipple:

1. Cross-ques. When did you leave the employ of the Camden and Amboy R. R. Co.?

Ans. I think, to the best of my knowledge, it was in 1858 or 1859; I cannot say which.

2. Cross-ques. Do you know what brakes were in use on the Camden and Amboy road from 1843 to 1848?

1009 Ans. I know nothing previous to my entering their employ.

3. Cross-ques. Was the Tyler car rebuilt, or not, soon after you entered the employ of the Camden and Amboy road?

Ans. Not to my knowledge.

4. Cross-ques. Had it have been rebuilt, would you have known it? that is to say, had it been rebuilt in the year 1849?

Ans. I think I should; for it could not have been used on the train, if it were a new car; I mean on that train.

5. Cross-ques. Do you know what brakes were in use, on all the cars of the Camden and Amboy road, from 1848 to 1851?

Ans. I know nothing of any of the cars except those I was connected with.

6. Cross-ques. Do you know that there was no car run in the trains of which you were baggage-master and conducter, from 1848 to 1851, that had a double brake on it?

Ans. I have no recollection of such.

7. Cross-ques. The question is, do you know, of your own personal knowledge, that there was not any car run in the trains of which you were baggage-master and conductor, from the time you entered the employ of the Camden and Amboy Co. to the year 1851?

Ans. I can only answer to my belief; I believe there were none.

8. Cross-ques. Do you know there were no such cars used on those trains?

Ans. I form my opinion from the circumstances and situation that I was placed in in different parts of the trains that I was connected with; for instance, if the engineer blew his whistles for the brakes, I, as conductor, generally assisted in plying the brakes, and I never knew any difference in the brakes at that time.

1010 9. Cross ques. Is there any difference in the application of power to a single brake than to a double brake? If there is, please explain the difference.

Ans. The single brake acts upon one truck, while the double brake acts upon both.

10. Cross-ques. Is the source of application of the power the same in both instances; that is to say, is the power in both instances applied through a brake windlass?

Ans. Yes, sir.

11. Cross-ques. Was there any pawl and ratchet-wheel on the windlass staff to hold the power when the brakes were applied by the brakeman?

Ans. I know there was one on the brake in the gig-top, where the lookout brakeman was; as to the other cars, I know there were a good many that did not have it at that time.

12. Cross-q. Did you know Edwin Lockwood who had charge of the car-department of the Camden and Amboy road?

Ans. I know him.

13. Cross-ques. Did you know him from 1848 to 1851?

Ans. Not the whole time.

14. Cross-q. When you did know him, what did you understand to be his position on that road?

Ans. I believe he was master mechanic of the car-shops on that road—of the car-department.

15. Cross-ques. Do you think M'r Lockwood would be likely to know what brakes were on the Tyler car from 1848 to 1851?

Ans. I suppose he would.

16. Cross-ques. Do you know, from personal inspection, that there was no double brake on the Tyler car from the year 1848 to 1851?

A. I only know from the working of the brakes.

17. Cross-ques. What do you know about the working of the brakes?

Ans. I know the working of a single brake from a double; one applies only to one truck, the other to both.

1011 18. Cross-q. What kind of a brake was on the Tyler car when you left the employ of the Camden and Amboy Company?

Ans. I do not know. I do not know that I had seen the car for some two or three years before I left.

19. Cross-ques. Did you ever see a double brake on the Tyler car?

Ans. Not to my knowledge.

20. Cross-ques. To what extent were double brakes in use on the Camden Amboy road when you left the employ of the company?

Ans. I believe they were on most all of the cars in the regular trains; I mean by that the express-lines.

21. Cross-ques. Could there have been a double brake on the Tyler car in 1851 or 1852 and you not have known it?

Ans. There could after my connection with the car ceased.

22. Cross-ques. When did your connection with or knowledge of the Tyler car cease?

Ans. I never knew much of it after taking charge of the regular express-line—the nine or ten o'clock train.

23. Cross-ques. What year did you take charge of that train?

Ans. Well, as I said before, it was in 1850 or 1851; I can't say which.

24. Cross-ques. Then your knowledge of the Tyler car is confined mostly on the year 1849, is it?

Ans. To 1849 and 1850.

25. Cross-ques. Then you do not recollect of the Tyler car being ebuilt in 1849; but you do recollect, as you say, what brakes were on it at that time, do you?

Ans. I do; by the using of them.

J. C. NOSTRAND.

Sworn to and subscribed before me this twenty-fifth day of May, A. D. 1868.

W. GRIER HIBLER,
U. S. Commissioner.

1012 JOHN BRIGGS, j'r, being sworn, deposes and says:

1. Ques. What is your age, residence, and occupation?

Ans. I think my age is about fifty-four; residence Philadelphia; occupation, I suppose, you would call that of a gentleman, as I am doing nothing.

2. Ques. What was the last occupation in which you were engaged?

Ans. I was ticket-agent for the West Jersey Railroad Co. from Cape May to Philadelphia.

3. Ques. About how long were you engaged there?

Ans. During one season; the summer season.

4. Ques. Were you ever in the employment of the Camden and Amboy R. R. Co.; and, if so, in what year did you go into their employ?

Ans. I was. I went there in the year 1849. I think it was in the month of March.

5. Ques. In what capacity were you employed by said company at this time?

Ans. As baggage-master first. I think I remained baggage-master for two years, or nearly so; then I was appointed conductor in the place of Van Doren.

6. Ques. What kind of trains did you run on as baggage-master and conductor?

Ans. They were all through trains to New York.

7. Ques. When you first went into the employ of said company in 1849, what kind of brakes were they using on their passenger-trains?

Ans. All single brakes, I believe.

8. Ques. Upon how many wheels did their brakes operate from one windlass?

Ans. They were intended, I suppose, to operate on all the wheels of the car; none of the brakes were of much account.

9. Ques. What do you understand by single brakes?

Ans. I always understood that the single brake was to apply to the whole truck; one truck at that end where the brake was applied.

1013 10. Ques. Then how do you mean to be understood in your 8th answer?

Ans. I don't mean to say that by applying the brake at one end it would operate on both ends, for it would not.

11. Ques. Was there a single brake at each end of the cars you referred to when you made your 8th answer?

Ans. Yes; there was.

12. Ques. Did you ever know of double-acting brakes being used on the cars of said Camden and Amboy Co.; if so, about how long was it after you first went into their employ?

Ans. Yes, sir; it was about two and a half years after I first went into their employ.

13. Ques. Do you remember any circumstance connected with your first finding out that said company was using double brakes on any of its cars? If so, please state the circumstance.

Ans. Yes, sir; many of our passengers found it out as soon as I did. The circumstance was that we generally ran so fast while coming into Burlington, that we frequently ran by the station; that is, our way-cars, in which we wanted to put our commutation passengers. After they put those brakes on we could stop much more quickly than we could before, because we had more power to hold: with the other brakes it was like sliding over a greased plate.

14. Ques. What brakes do you mean by the other brakes?

Ans. The single brakes; those that were previously in use on the cars.

15. Ques. When you say "we generally ran so fast while coming into Burlington," etc., what train did you refer to?

Ans. The train I was running; the mail-train.

16. Ques. About how long after you first went into the Camden and Amboy Company's employ was it that you first noticed that you could stop more quickly when coming into Burlington than you could before, with the single brakes?

Ans. It was two or three months after 1851, about two and a half

1014 years after I first went into their employ in 1849.

Cross-examined by M'r Whipple:

1. Cross-ques. When did you leave the employ of the Camden and Amboy Railroad Company?

Ans. In the latter part of 1863.

2. Cross-ques. Do you know what brakes were in use on the Camden and Amboy road before you went there in 1849?

Ans. I do not. I suppose they were the same as they were using when I went there; they had the single brakes when I went there. They made no change. They had the single brakes for some time afterwards—certainly two years.

3. Cross. Do you know that there was no double-acting brake in use on any car of the Camden and Amboy R. Road from 1849 to 1852?

Ans. I know they were there before 1852.

4. Cross-ques. Do you know from personal inspection of all the passenger cars on the Camden and Amboy road that there was no double brake on a car or cars of that road in 1849 and 1850?

Ans. That is a question that I should not like to answer, as I never saw more than half their cars. There was none at that time on any of the cars over which I had control.

5. Cross-ques. Are you familiar with the construction and operation of double-acting brakes?

Ans. I can't say that I am with the construction, but I am with the operation. I know when they are in order and out of order.

6. Cross-ques. Please describe the operation of a double-acting brake.

Ans. They operate on both ends of the car at the same time—that is, they check the whole running-gear of one car at the same time.

7. Cross-ques. Would or not a brakeman at each end of the
1015 car with a single brake on it have the same effect in stopping
the cars as a brakeman at one end would have on the same car
with a double brake?

Ans. I don't think it would.

8. Cross-ques. Why not?

Ans. I don't think that a single brake would have the same effect by applying it at each end that the double brake would, because the double brake is applied to all the wheels at once, and is more instantaneous, and would be more of a check to the wheels.

9. Question. What brakes were in use on the cars of the Camden and Amboy R. R. when you left the employ of said company?

Ans. That I cannot answer, as I was ticket-agent six years before I left there, and I did not know what was on the cars during that time; but when I left the cars they were all, or nearly all, double brakes.

10. Cross ques. When did you leave running upon the road?

Ans. I think I left running on the road either in the latter part of 1856 or the fore part of 1857.

11. Cross-ques. Do you know of your own personal knowledge that there was not a passenger and platform crate car for carrying baggage, on which a double-acting brake was in use, on the Camden and Amboy road before 1851?

Ans. I think there was none; I never heard of any. If there had been, I should have known it; I know I should have known it.

12. Cross-ques. Did you inspect all the cars of that road with a view to ascertain what brakes were on the cars of said road during this time?

Ans. If there were any changes made, I did.

13. Cross-ques. I asked you if you inspected the cars?

Ans. No, sir; we had an inspector at Camden to do that.

14. Cross-ques. Do you wish to be understood that you know nothing of what brakes were in use on the cars of the Camden and Amboy Railroad before you went into their employ?

1016 Ans. No; I do not. I know there were no double brakes, as they would never have taken them off to put on single brakes.

15. Cross-ques. Do you know that there were no double brakes in use on the cars of that road before 1849—before you went there?

Ans. I do not. I answered that a moment ago.

Re-examined by M'r Cozzens:

17. Ques. Between 1849 and 1851, did you know of a car on the Camden and Amboy R. Road called the Tyler car?

Ans. I did.

JOHN BRIGGS, J'R.

Sworn to and subscribed before me this 25th day of May, A. D. 1868.

W. GRIER HIBLER,
U. S. Commissioner and Examiner.

NEW YORK, *May 27th*, 1868.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

HENRY TANNER, a witness of lawful age, produced on the part of the complainant, having been duly cautioned and sworn, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Henry Tanner; I am 54 years of age; reside at Buffalo, in the State of New York; I have no particular occupation at present.

2. Q. Are you the person to whom the letters patent on which this suit is brought were issued?

A. I am.

1017 3. Q. Have you any interest in this controversy, or in the said letters patent, either as respects the first term or the extended term thereof?

A. None whatever.

4. Q. Did you ever at any time visit any railroads in New Jersey, or any persons connected with any New Jersey railroads, in reference to the matter of a double-acting car brake? If yea, please state when you did so, where you went, for what purpose you went, whom you saw, and what took place. Answer fully.

A. I visited different persons in New Jersey connected with railroads at different times. The first time that I visited New Jersey with a brake must have been in 1849. It was the Turner brake; it had on the self-acting and also the single centre-lever attachment. At this time I visited a M'r Baker, at Jersey City, and the reason of my going to him at that time with the brake was, I had a letter of introduction to him from an old shopmate of his, and a friend of mine, in Rochester, of the name of Wiser. I went with the hope of getting him to introduce the Turner brake on the New Jersey Railroad. I did not succeed in getting it introduced at that time. He did not seem to like the self-acting part of the brake. After laboring among other roads for some time to introduce the Turner brake, and getting it on some cars in one form or another, finding it difficult to get this self-acting brake into operation, I had a model made of the centre-lever that was contained in the Turner brake, separating it from the self-acting part, and in that shape had introduced it on several roads, and returned to see M'r Baker, as near as I can fix it, in 1851, with the single lever on this model that I had had made. I went then to see if I could get him to put the single lever on, without the self-acting part. I found that he was already doing it. He was putting them on while I was there, on one or two cars, and I urged him at that time to fit up a train with them, so that he might be sure that they would work. I recollect that I offered to pay him if they did not work, and, if he had to take them off, to pay him for all the labor that was done. From that interview 1018 with Baker I went to Bordentown, to the Camden and Amboy shops. I saw a man there that was introduced to me as M'r Lockwood. I never had seen him before. I exhibited the model to him, and told him that I wanted to get the brake on that road also, and told him what M'r Baker was doing. We talked a good while about it, and he declined to put it on at the time, and the reason he gave was that they were putting on, or were going to put on, the Hodge brake; that they had made arrangements for that. I claimed the Hodge brake to be an infringement of the one I had, but met with no further success in getting my own (the Turner) brake introduced on the Camden and Amboy at that time. I don't recollect whether I went again to them. I saw Baker again once or twice. I do not recollect that I went to any other road in New Jersey to get it introduced.

5. Q. You say "from that interview with Baker I went to Bordentown." How soon after the interview with Baker did you go to Bordentown, and in what year was it?

A. The year that I have named, 1851, and on the day following my interview with Baker. M'r Baker had given me Lockwood's name, and advised me to go down there.

6. Q. At this time, when you saw Lockwood at Bordentown, did you see any of the Camden and Amboy Company's passenger-cars there?

A. Yes, a great many of them.

7. Q. Did you see what kind of brakes were upon those cars; and, if so, what kind were they?

A. Yes, I did see what kind of brakes were on them, and I saw no brakes upon the cars there except the old brake that braked on one truck—unless it were one or two Hodge brakes that they were then putting on. It appears to me that they were putting on one or two Hodge brakes, but I am not clear about it, as it was a good while ago. There were no double brakes on the cars, unless the Hodge brake, as I have excepted.

8. Q. What is it you mean you are not clear about?

1019 A. About the fact that they were then putting on the Hodge brake, or whether Lockwood simply told me that he was going to put them on.

9. Q. Do you know what position on the Camden and Amboy road this Lockwood occupied at that time?

A. I cannot say that I do of my certain knowledge. I understand he was superintendent of car-repairs.

10. Q. Had you about this time seen cars of the Camden and Amboy Company at other places than Bordentown? If so, mention some of the places, and state what kind of brakes such cars so seen by you had upon them.

A. I had ridden on them between New York and Philadelphia a great many times, and from the time I first had any interest in a railroad brake of any description up to the time I parted with that interest, I never saw a car anywhere in the land that I did not examine the brake of to see what kind it was, and I never saw a double-acting brake on any car belonging to any road until I began to put them on in 1848 or 1849. The Camden and Amboy Railroad cars had not, any of them that I saw, any double-acting brake on them up to this time we are talking about, 1851.

11. Q. You say that you had ridden on these Camden and Amboy cars between New York and Philadelphia a great many times; in what years were these times?

A. I am alluding now to the years 1848, 1849, 1850, and 1851, and nearly every year since.

12. Q. Had you, about the time and previous to the time of the interview with Lockwood in 1851, seen any of the Camden and Amboy cars at any other places than Bordentown; if so, at what places?

A. I had seen them at other places—some in Jersey City and some on the line of the road while I was riding on it.

13. Q. Did you observe what kind of brakes these cars had; if so, what kind were they?

A. I did; they were the old brake, braking on one single truck.

14. Q. You have said that when you went to Lockwood in 1851
1020 he declined to put the single centre-lever double-brake on the
Camden and Amboy cars, and that the reason he gave you was that they were putting on, or going to put on, the Hodge brake. Did he give you any other reason than this?

A. No, he did not.

15. Q. About how long did you talk with Lockwood at this time?

A. I do not recollect. I was there two or three hours, talking with him most all of the time about something.

16. Q. How distinct is your recollection of what took place with him at this interview?

A. There are some features about it very distinct. The words I cannot recall. I recollect distinctly sitting down with him on the side of the railroad track while I was waiting to get away, and talking there with him quite a while in the warm sun and sand.

17. Q. You say some features of the interview are very distinct. State generally what features you refer to.

A. I refer to that contained in my former answer—sitting there and talking—that is very plain to me now—for one thing—and the exhibiting to him the model I had with me and the long talk upon it—these are more particularly the points I refer to.

18. Q. And how distinct is your recollection respecting the matters you have testified to in relation to your wanting him, Lockwood, to put your single centre-lever double-brake on the Camden and Amboy cars, and his declining to put it on, and the remainder of that interview as you have here testified to it?

A. My mind is very clear on those points and in this full testimony, where I have had hesitancy, I have tried to show it in the answers.

19. Q. During this two or three hours interview with Lockwood did he say anything to you about a single centre-lever double-acting brake having been used on cars of the Camden and Amboy Railroad in the
year 1843 and after that time?

1021 A. Never—the first word or thought. Had he done so I would
have investigated it thoroughly on the spot as it would have been my duty to do.

20. Q. Did he in that interview say anything to you about there having been a single centre-lever double-acting brake used on cars of the Camden and Amboy Railroad at any time prior to the time of said interview.

A. Not one word.

21. Q. Did he in that interview say anything to you about a car of the Camden and Amboy Company, called the Tyler car?

A. No, sir; I never heard of that car until I read of it in a book of evidence sent to me by somebody. I think M'r Whipple sent it. I do not know where it came from.

22. Q. Did you, during this visit to Bordentown, hear anything from anybody, either about a car called the Tyler car or about single-lever double-acting brakes having been used on cars of the Camden and Amboy Company prior to such visit?

A. No, sir; not a word from anybody.

23. Q. Were you the plaintiff in a suit brought against the New York and Erie Railroad Company for the infringement of the patent now in controversy?

A. I was.

24. Q. Had you at any time prior to the trial of that suit, or have you at any time since said trial, learned of the use of any double-acting

brakes prior to the Batchelder & Thompson invention, other than the matters discussed at said trial ?

A. I never have heard of anything, unless it is what you have in controversy now, and I never heard of this until the present time.

And being cross-examined by M'r Whipple, of counsel for defendant, he says:

1. Cross q. Do you wish to be understood that of all the cars which you examined, owned by the Camden and Amboy Railroad Company, you did not see any double-acting brakes on said Camden and Amboy cars prior to 1851 ?

A. I do mean to be so understood.

1022 2. Cross-q. Did you examine all the cars owned by said company, and run on the different lines of said Camden and Amboy Company ?

A. No; I have no idea that I did.

And being re-examined by M'r Cozzens, he deposes:

1. Redirect q. You are asked whether you wish to be understood that you did not "see" any double-acting brakes on any of the Camden and Amboy cars prior to 1851. Do you know what kind of brakes were on those Camden and Amboy cars seen by you prior to 1851, and prior to the time of your interview with Lockwood ? and, if you say that you know what kind they were, please state what kind.

A. I do know what kind they were; they were the common single-acting brake, working on one truck only.

HENRY TANNER.

Subscribed and sworn to before me this 27th day of May, 1868.

JOSEPH GUTMAN, Jr.,
Examiner, &c.

Examination further adjourned to May 28, 1868, at 4 p. m.

May 28th, 1868—4 p. m.

Present, M'r Cozzens, for complainant, and M'r Whipple, of counsel for defendant.

Redirect examination of witness Henry Tanner, resumed by M'r Cozzens:

2. Redirect q. In your 4th direct answer you said that you had a model made of the center lever that was contained in the Turner brake separating it from the self-acting part. Will you please describe that model ?

1023 A. It was made with a center lever fastened to the frame of the model in the middle of the lever, with rods running from each end of the centre lever to each brake-staff upon the opposite end of the car, and other rods running from the quarter of the centre lever to levers in the trucks each way. It was like the description of the lever in the Batchelder & Thompson patent, called the Tanner patent, as that patent was issued to me, and I used that same model in exhibiting the Tanner patent for sale after that patent was issued. By the lever in the truck, I mean such as was used in the old trucks of the single brake.

3. Redirect q. Then you do mean that the entire brake, as shown in this model, was the same as the entire brake shown in the Batchelder & Thompson or Tanner patent you have referred to ?

A. I do.

4. Redirect q. You also stated in your 4th direct answer that "you exhibited the model" to the man you saw at Bordentown, who was introduced to you as M'r Lockwood; what model was this?

A. The one described in the answer above.

And being further cross-examined by M'r Whipple, he deposes and says:

1. Recross-q. In what year did you exhibit this model as already described, as you say, to M'r Lockwood?

A. In the year 1851.

2. Recross-q. What time in that year?

A. I think it was early in the fall; it was warm weather.

3. Recross-q. Did you, during the year 1851, go to the Hartford and Springfield Railroad Company, whose shops are located at Hartford, for the purpose of introducing the Turner brake?

A. I think I did; I am quite sure I did.

4. Recross-q. Did you there find in use upon the cars of that road a centre-lever brake claimed to have been invented by one Willard J. Nichols?

A. I found either at the first of my going there, or at some sub-
1024 sequent dates, a centre-lever brake in operation there that they
claimed was the production of M'r Nichols. I am not sure whether they said it was a production of M'r Nichols the first time I went there, or when I was there pressing for payment.

5. Recross-q. Did you find, on investigating, the time when the said double brake, claimed to have been invented by said Nichols, antedated the Turner patent of November 14, 1848, in which there is described a centre lever?

A. They claimed that it antedated the Turner patent, so far as the single lever in that patent was concerned. I do not recollect whether I made any investigation at that time respecting the bearing of the Nichols invention on the Turner patent that satisfied me in the case one way or another; but I did make an investigation subsequent to that after I had got out the Tanner patent, and after I had commenced suit against the Erie Railroad, and had received notice of this invention of Nichols as a defence; and that investigation was made entirely with reference to that suit to see how I stood with it.

6. Recross-q. On such investigation, whenever it was made, did you come to the conclusion that the claim of the time when the Nichols brake was invented antedated the Turner patent?

A. I do not know that the Turner patent was then in my mind, as I was not fighting for that; but, as I recollect it now, the claim that they put up did antedate the Turner patent, if that claim was correct.

7. Recross-q. Did you, during the year 1851, or at any time in that year, execute to the widow of Willard J. Nichols a bond agreeing to pay to her or any person in trust a certain sum from collections made on the Turner patent?

A. I don't recollect whether it was in the year 1851 or later, but there was a bond given to some name that I have forgotten—to a M'r Durand, I believe—to pay some sum, I don't recollect what, from collections
that might be made on this single lever in the Turner patent; that
1025 bond was given because of the investigation—the two things run-
ning so near each other—to settle the matter; and, in recollecting this, I think there must have been an investigation made on the Turner patent, and that investigation must have been made with this

very model, probably at the very time when I went there with the model.

8. Recross-q. May it be inferred from the fact of your executing such a bond to said Durand, in trust for the widow of Willard J. Nichols, that you came to the conclusion, after investigating the matter of dates, that the Nichols brake did antedate the Turner brake?

A. No; there was not that thorough investigation to give it that character, even if it existed there. M'r Durand represented her case to me as being poor, claiming that Nichols, her husband, had invented this and was dead, and even if M'r Turner had also invented it, and I was to make money out of it, I ought to help her as she was poor, and I therefore gave that bond.

9. Recross-q. At the time of your going to the Camden and Amboy road, as you say, were you acting as agent of C. B. Turner, or as owner of said Turner patent?

A. I was acting as agent under an irrevocable power of attorney.

10. Recross-q. At this time did you know of the application of Thompson & Batchelder for an alleged improvement in railroad-car brakes, of which application you afterwards became the owner?

A. No; but I became aware of Batchelder & Thompson's application at or about the time that I made the application for the reissue of the Turner patent. I first became aware of their application from the Patent Office when I made the application for the reissue of the Turner patent, and whilst that was pending.

11. Recross-q. Did you know of said Thompson & Batchelder's application at the time of your going to Hartford, and before executing said bond to the said Durand?

A. No, sir; I did not.

12. Recross-q. How were the connections made to the centre lever of the Nichols brake, in contradistinction from the connections as in the model of the Turner brake when you went to Hartford and saw in use the said Nichols brake? 1026

A. I think there was no difference to amount to anything, at least.

13. Recross-q. Soon after becoming owner of the Turner patent, did you apply to the Patent Office for a reissue of said patent?

A. I did; but I cannot say exactly how soon; it was not a great while.

14. Recross-q. Before the time of this application, whenever it was, do you wish to be understood that you knew nothing of the application of Thompson & Batchelder to the Patent Office for an alleged improvement in railroad car brakes?

A. Yes, sir; I wish to be so understood—and for quite a time after the application was made.

15. Recross-q. At what time as near as you can recollect did you make such application for a reissue?

A. I cannot give the date.

(The witness is here presented with a certified copy of his application for a reissue of said Turner patent and is asked)—

16. Recross-q. Whether it correctly represents said application as to date of signing and subject matter?

A. I presume it does. I know no reason why it is not a correct copy.

17. Recross-q. Will you annex the aforesaid application and make it a part of your deposition and mark it Exhibit H?

A. I have no reason to doubt the genuineness of the article. I have no objections to its being attached and marked as called for in the question, but I do not know that I can swear to its truthfulness, as I did not make it or compare it.

18. Recross-q. Did you set up in said reissue the following claim, to
wit: "What is claimed is to so combine the brakes of the two trucks
1027 with the operating windlass or mechanism at either end of a car
by the reciprocating lever *b*, or its equivalent, so as to enable a
brakeman or person by manual power and by turning or operating the
windlass or its mechanical equivalent at either end of the car to bring
or force the brakes of both brakes simultaneously against their respective wheels"?

A. That question being read from Exhibit H, I have no doubt it was my claim then made.

19. Recross-q. And is there also a claim in said application for reissue slightly modified from the one just quoted, signed by Cooper, which is as follows in pencil and appended to said application, or rather prefixed to the same, which reads as follows:

"But what I do claim and desire to secure by letters patent is so to combine the brakes of the two trucks with the operative windlasses or their equivalents at both ends of the car by means of the vibrating lever *b* or its equivalent, as to enable the brakeman by operating either of the windlasses to apply the brakes of both trucks simultaneously, and whether he be at the forward or rear end of the car.

"COOPER."

A. The Cooper signed there is Samuel Cooper, who was at that time examiner in the Patent Office. He wrote that claim and suggested it to me as one that he would allow on that reissue. I think he wrote the whole of it.

20. Recross-q. Was the model or one like it which you say you showed
to Lockwood in 1851 and the one you exhibited at Hartford the same
year as a model of the Turner brake put into the Patent Office as a
model, in your application as assignee of Thompson and Batchelder, for
an alleged improvement in railroad car brakes, and was the following
claim set up in said application, to wit: "But what is claimed by us is
to so combine the brakes of the two trucks with the operating windlasses
or their equivalents at both ends of the car by means of the vibrating
lever A, or its equivalent, or mechanism essentially as specified, as to
enable the brakeman by operating either of the windlasses to simultaneously apply the brakes of both trucks, or bring or force them
1028 against their respective wheels, and whether he be at the forward
or rear end of the car"? and is the lever called *b* in the claim for
the reissue of the Turner patent the same as designated by lever A in
the Batchelder and Thompson patent issued to you as assignee?

A. There was, I think, a model put into the Patent Office representing the same design; whether exactly like it I cannot tell now. The claim, I think, is correctly quoted as set up. The levers are intended to be the same.

21. Recross-q. And is the manner of connecting the rods to the lever the same in both cases?

A. The lever alluded to in the claim I asked for in the reissue of the Turner patent and the lever granted to me in the Batchelder and Thompson or Tanner patent and the rods attached to the levers and the windlasses in both cases were intended to be the same and do the same work.

And being again re-examined by M'r Cozzens, he says, as follows:

5. Redirect q. You have stated in your cross-examination that when you executed the Durand bond you did not know of Batchelder and

Thompson's application. Did you know of their invention when you executed that bond?

A. No, sir; nor for some time after.

6. Redirect q. Was your application for the Turner reissue before or after your visit to Bordentown in 1851, when you saw M'r Lockwood?

A. It was afterwards.

HENRY TANNER.

Subscribed and sworn to before me this 28th day of May, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to June 9th, 1868, at 11 a. m.

1029 In the circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company.
} In equity.

Testimony taken on the part of complainant, before W. Grier Hibler, United States commissioner and examiner, in the city of Philadelphia, under the rules of the Supreme Court of the United States.

JUNE 10TH, 1868.

Present, M'r S. D. Cozzens, for complainant, and the complainant in person; M'r S. M. Whipple, for respondents.

WILLIAM W. HUBBELL, a witness on the part of the complainant, being duly sworn, deposes and says:

1. Q. What is your name, age, residence, and occupation?

Ans. My name is William Wheeler Hubbell; residence is Philadelphia; occupation is that of a lawyer, and am in my 48th year.

2. Q. Have you been engaged in the management of cases arising upon letters patent for inventions; and, if so, for about how long?

Ans. I have, at times, for about twenty years.

3. Q. Have you made any inventions? If so, please mention some of them.

Ans. I have made a great many inventions in different matters. I have invented spark arresters for locomotive engines in 1841, and 1030 afterwards, about that time, improvements in car wheels; also, shells and fuses used by the United States, breech-loading fire-arms of different kinds, and other inventions.

4. Ques. Do you remember a suit brought in the State of New York, in or about the year 1853, by Henry Tanner vs. The Hudson River R. R. Co., for an infringement of the double-acting car-brake, known as the Tanner brake; and were you one of the counsel engaged in that case?

Ans. I do remember that suit. I was one of the counsel in the case with M'r Gifford and M'r North, who were also of counsel for the R. R. Co. with me.

5. Ques. Did you personally make any investigations in that case relative to the novelty of the invention of the Tanner brake; and, if so, did you come in contact with any person or persons who furnished any information respecting prior brakes; and, if you did, please state who such person or persons were?

Ans. I did make investigations respecting the use of brakes; there were a great many persons talked with and spoken to by myself. I could not pretend to remember them all; but one prominent person I remember was M'r Joseph Talson; M'r Stevens, I think, was also spoken to. I think he had a brake—Francis A. Stevens.

6. Ques. Had this Talson been connected (if you know) with any railroad; if so, with what railroad, and did you see him more than once upon this subject of prior brakes?

Ans. He said that he had been connected with the New Jersey Railroad and Transportation Company. I think he was seen at least twice by me in New York.

7. Ques. Will you state what information was furnished to you by Talson in said suit?

Ans. The information that he had and gave was that he had tried a brake on the New Jersey Railroad and Transportation Company's road running from Jersey City, experimentally, which he called a double-acting brake. My recollection is that he had used cords in making the experiment, and that they broke, and that he tried chains and
1031 they gave way, and that it was not continued in use. He described
it as intended to be the same in principle as the Tanner and that a M'r Stanley had had something to do with suggesting it. That was all the knowledge that he seemed to have about prior brakes, and that was all he communicated or pretended to know about it.

8. Ques. How full and thorough was the investigation and preparation on the part of the railroad company in that case?

Ans. It was as full as they could possibly make it for the time set for trial, and in consultation with M'r Gifford and M'r North, at M'r North's office at New York, and reviewing the whole of the case as it stood, we concluded that we could not stand on the defence, and that if M'r North could get it continued and settle it, he had better do it.

9. Ques. In that case was there any information obtained by you, or to your knowledge by the defendants, relating to brakes prior to the invention of the Tanner brake, which was not investigated?

Ans. The notices of special matter in the case contained the names of persons whom I have not seen. Those notices, I think, were given by M'r North or M'r Gifford, before I was brought into the case. There was no information obtained from them that was reliable for a defence; the Thompson and Batchelder application in the Patent Office dated so far back that it cut us out of most of the special matter. We did investigate all the information that we had amongst us; there was no pretence at that time of any other information than that which we had.

10. Ques. Did Talson, in either of the interviews which you had with him, say anything about a double-acting brake having been used on a car called the Tyler car, belonging to the Camden and Amboy Railroad Company, or upon any other car or cars belonging to said company?

Ans. No; not at all. There was no pretence of any knowledge of any brake on the Camden and Amboy Railroad on any car.

1032 11. Quest. As nearly as you recollect, in about what year or years was it that you saw Talson as you have stated?

Ans. I think it was in 1853, before that Hudson River case was appointed to be heard. It was at the office of the company that I saw him.

12. Ques. Were you after this date, 1853, engaged in any other suit which had been brought upon the Tanner patent; and, if so, about when, and what suit was it, and how were you engaged in it?

Ans. I was engaged on behalf of the Phila., Wilmington, and Baltimore Railroad Company, in the defence of a suit brought against them under the Tanner patent, by M'r Sayles, as assignee, in the circuit court of the United States in and for the eastern district of Pennsylvania. I had charge of the preparation of the case for the company, and attended to it personally in the years 1858, 1859, and 1860, and think it ran into 1861 and 1862.

13. Ques. In the course of this preparation, did you make any investigation into the subject of brakes prior to the invention of the Tanner brake; and, if so, over about how long a period of time did such investigation extend, in what localities were they made, and what brakes were investigated? Please answer fully.

Answer. I made investigations as to brakes prior to the date of the Tanner patent in every direction where there was any information to be obtained; it extended over about two years of time. There were investigations made in Baltimore, Washington, Philadelphia, Bordentown, New Jersey; Boston, New York. There were a great many brakes investigated; there were all that were found on file in the Patent Office; there were Milholland brakes, Leahey brakes, at Baltimore; there were the brakes on the defendants' road; also, as to brakes on the Camden and Amboy Railroad; also, as to the experiments of Thompson and Batchelder; also, as to a brake on the New Haven, Hartford, and Springfield road, called the Nichols brake; also, as to brakes made by Eaton, Gilbert & Co. Those were the principal investigations, I believe.

1033 14. Ques. You say that you investigated in this Philadelphia suit the subject of brakes on the Camden & Amboy Railroad. Will you state what turned your attention to that road, and at what place or places on the road you made your investigations?

Ans. I had made experiments with a spark-catcher for locomotives on that road in 1842, and was intimate with Isaac Dripps, the principal machinist or engineer at the company's works at Bordentown, and knew M'r Robert L. Stevens and Edwin Stevens, and I wanted to know what information was to be had there about double-acting brakes. I knew M'r Dripps to be a very smart, observing man, and that he could tell me all that was to be found out there; that is, on the Camden and Amboy R. R. I made the investigations at Bordentown, and also from M'r Dripps, himself, at Philadelphia.

15. Ques. Have you any memoranda relating to these investigations so made by you in respect of the Camden and Amboy R. R.; and, if yea, will you produce the same?

Ans. I have memoranda in my private book of record of the case which I have here, but it is my business-book, and I cannot part with it. I can give you the memoranda from the book, as follows: "1859. November 15—Professional services, examinations Baldwins & Norris' letter to Dripps, &c."; that part of it, "letter to Dripps, &c.," was a letter to M'r Dripps concerning the use of brakes on the Camden and Amboy Railroad, inquiring as to their use. There is also another entry in the following January, the 18th, as follows: "Letters to E., G. & Co., Dripps' services, etc., etc."; that means that there was a letter written by me to Eaton, Gilbert & Co., inquiring as to their manufacture of brakes, and also a letter to M'r Dripps inquiring as to double-acting brakes on eight-wheeled cars on the Camden and Amboy Railroad. M'r Dripps was then master machinist of the Pittsburg, Fort Wayne, and Chicago Railroad Company, at Fort Wayne, Indiana. These memoranda were made in my book in relation to the account I kept of charges and expenses in the case.

1034 16. Ques. Will you state by whom and in whose handwriting these memoranda were made, and when they were made, and in whose possession the book containing them has been since they were made?

Ans. They were made by me; they are my handwriting at the times they are respectively stated; the book has been in my possession since; these memoranda are headed Sayles vs. Philad'a, Wilmington & Balt. R. R. Co., 1858; that is the general heading to the memoranda, which are very numerous.

17. Ques. You refer in your fifteenth answer to two letters to Dripps—one mentioned in the entry dated November 15, 1859, and the other in the entry dated Janu. 18, 1860. Will you please state how two letters came to be written to Dripps.

Ans. My recollection is that the first letter was directed to him at Bordentown, N. J., under the supposition that he was there, as that was where I had known him to be since my first acquaintance with him in 1842, and I was not aware that he had left there; I never got an answer to that letter; I afterwards found that he had left there, and got his address at Fort Wayne, Indiana, and wrote to him there; I learned from the foreman of the car shop, M'r Lockwood, that he had gone to the Pittsburgh, Fort Wayne & Chicago Railroad, and also from the clerk at the company's office, at Bordentown, at which latter place I got his address in writing.

18. Ques. Which of these two letters, if either, is the one which you addressed to him at Fort Wayne?

Ans. The one in the memorandum of January 18th, 1860, mentioned.

19. Ques. Have you the original or a copy of this letter, and did you ever keep any copy of it?

Ans. I think I did not keep a copy of it; the original was sent to M'r Dripps; I have not seen it since; but I have his reply to it.

20. Ques. Will you please produce the reply and annex it to this deposition?

Ans. This is it, dated January 31st, 1860; I do annex it to my deposition.

1035 (See reply annexed, marked "Complainant's Exhibit, Dripps, new proofs.")

21. Ques. After receiving this reply from Dripps, what, if anything, did you do in relation to it?

Ans. I went to see what information I could get. I went to Bordentown, to the shops, which were below Bordentown, to see the foreman of the car shop, M'r Lockwood. I had been there before, and asked him about the double-acting brakes. He could not tell me the time when they were first used, but from the description of the brake having horizontal levers swinging free from the body of the car, I found it was the Hodge brake that was first used, and afterwards the nearest information I could get of the date from M'r Lockwood was about 1851. I was not satisfied about it until I had seen M'r Dripps, and I afterwards saw him in Philadelphia, and I learned all the facts about the use of the double brake on the Camden and Amboy railroad. M'r Dripps himself informed me that there was no double-acting brake used before 1851 and 1852. The information that I obtained was that the Hodge brake was the first double-acting brake used on the Camden and Amboy Railroad, and was used in 1851. There was no double-acting brake of any kind used before that time upon the Camden and Amboy Railroad, and that they had seen the centre-lever brake, or Tanner brake, as it is called, at Wilmington, on the Philadelphia, Wilmington and Baltimore road, which I represented, and they tried that on the Camden and Amboy road in 1852. I told him that was of no use to me in our case, as the Hodge patent was dated before that time, and the Tanner brake we had ourselves used in 1851; it was made by Eaton, Gilbert & Co., on a car built by them for the Phila., Wilmington and Balt. R. R. Co. So I did not take any testimony in the case, relating to any use on the Camden and Amboy Railroad.

(So much of the answer objected to as relates to what Dripps told the witness.)

1036 22. Ques. You have referred to your seeing Lockwood before you received the reply from Dripps, and have stated the information you received from him, Lockwood; did you see him again after you received Dripps' reply?

Ans. Yes; my recollection is that I did.

23. Ques. About how long, to the best recollection, after you received Dripps' reply, did you see Lockwood, and where did you see him?

Ans. It was down at the Bordentown shop, in the course of the next month, as near as I can recollect.

24. Ques. What information on the subject of double brakes did you obtain from Lockwood this second time?

Ans. That the description of the first double brake used on the Camden and Amboy road accorded with the Hodge brake, and the time was about 1851 when it was first used.

25. Ques. At either of these two interviews with Lockwood did you tell him what was the object of your inquiry of him about double brakes; if so, what did you tell him?

Ans. I told him that I wanted to see M'r Dripps to get information about the use of the double brakes on the road that I was defending, the Philad'a, Wilmington and Balt. R. R. Co., in a suit brought against them on the Tanner patent, and asked him what he could tell me about them. I had little or no acquaintance with M'r Lockwood, but M'r Dripps I knew very well, and for a long time.

26. Ques. Did Lockwood talk with you freely on the subject, and did he appear willing to communicate to you all he knew about it?

Ans. He did not talk much; he answered my inquiry as to how the brake was constructed, but he did not seem to me to know really much about it, particularly as to the time it was first used; and I did not rely much upon him, but sought to get the information from M'r Dripps. He did appear willing to communicate all he knew.

27. Ques. Did he say anything to you in either of your interviews with him about a double brake having been used on a car called the Tyler car, belonging to the Camden and Amboy Railroad, or upon
1037 any crate car, flat car, or any other car of said company in 1843, and after that time, and prior to the time when the Hodge brake, as he described it to you, was used?

Ans. No, he did not. Neither he nor any other person ever pretended that I ever heard of before this present time, that any double-acting brake was used on that road in 1843, or at any other time prior to 1851. If there had been any such pretension as that, I certainly should have heard it, in those suits in which I was engaged, and very likely in the great eight-wheeled car suit in which I prepared the defence.

28. Ques. As the result of your inquiries of Lockwood and your investigations, on the Camden and Amboy Railroad, respecting the history and use of double-acting brakes on said road, did you or not learn anything which you thought it advantageous or material to put in evidence

in the suit, Sayles vs. Philad'a, Wilmington & Balt. R. R. Co. in which you were engaged?

Ans. I did not, for the reasons that the Hodge brake put in use on the Camden and Amboy road in 1851 was antedated by the Hodge patent, and the centre-lever or Tanner brake, put in use on the road in or about 1852, was a copy of the brake that we used in 1851, on our own road, the Philad'a, Wilmington & Balt. R. R. Co., which was in evidence and prior to that time.

29. Ques. At the time when you made this investigation relative to the Camden and Amboy Railroad, what were your facilities for obtaining information from railroad companies about the use on their roads of inventions and mechanical devices?

Ans. I had acquired a pretty extensive acquaintance with the principal men acquainted with such matters on the railroad, growing out of the extensive preparations for the defence in the eight-wheeled car suit, brought by Ross Winans against the railroad companies, which lasted through several years previous to this latter brake-suit of 1858. I knew pretty well who to go to, to get information from, probably better than any other person at that time. The railroad companies always 1038 gave me every facility that I wanted for obtaining information. My business with them was always conducted fairly. They did not want to conceal anything, nor to deprive anybody of their just rights, and I had no difficulties in the matter.

30. Ques. You have spoken of investigating the Millholland brake; through whose instrumentality was that brake first brought up as a defence to the Tanner patent?

Ans. I believe I first discovered the history of it and brought it up in the defence.

Cross-examined by M'r Whipple:

1. Cross-ques. Do you mean by "copy" in your answer to the 28th direct interrogatory that it was a centre-lever brake?

Ans. I mean that it was a centre-lever brake; the idea of which was taken from similar brakes in use on the Philad., Wilmington and Baltimore R. R.

2. Cross-q. Wherein, if at all, did the two brakes differ?

Ans. I did not see the brake; the centre-lever brake distinguished it from the Hodge brake; they were alike in the distinguishing feature; whether they differed in any minor details I did not inquire, as that was not material and the time was too late to be of any use to me in the case.

3. Cross-q. What particular significance do you attach to the word "copy" as used in your answer to the 28th interrogatory?

Ans. I mean the use of a centre-lever attached to the body of the car copied from a similar fixture on the Wilmington road as the means of communicating the power between the trucks by means of a windlass attached to either end of the car, one windlass being at each end.

4. Cross-q. In your investigations, did you find that the centre-lever brake had been in use on any other road prior to its use on the Philad'a, Wilmington and Balt. road?

1039 Ans. Yes. It had been in use, I think, on the Fitchburg road, and Eaton, Gilbert & Co. had been sending it out with their cars, I think as early as 1850. The New Haven, Hartford and Springfield road had it in use, I think, before that. I was about to take the testimony as to its use, and it was made the subject of a stipulation; whether the stipulation was correct or not I did not know, but I was satisfied to take it. It was to the effect that it was in use in March or April, 1847. I have since been informed that this date was not correct; that it was in 1848. I know nothing of the fact, under the circumstances, as to when it was actually put in use.

5. Cross-ques. By who were you so informed?

Ans. I was informed by M'r Sayles, who made the stipulation with me, that he had since discovered that he had made a mistake.

6. Cross-ques. What was the result of this Philadelphia suit as it is called on brakes, in which Thomas Sayles is complainant, and the Philad'a and Balt. R. R. Co. is the respondent?

Ans. I do not know, of my own knowledge, how that was arranged about that suit; I was not consulted about its settlement. M'r Isaac Hazlehurst was the senior solicitor of the company; I understand that he had something to do with it. The record of the case in this court I suppose would show how it was determined. The case never came to trial, and it must have been either settled or withdrawn, but I do not know upon what terms.

7. Cross-ques. Was it or not dismissed by complainant paying costs?

Ans. I don't think it was dismissed by any judicial decision; I understand he withdrew it on leave and paid the costs, but upon what terms, or whether upon any terms, I don't know. I had nothing to do with the termination of the suit; I know that it was terminated without a hearing in court on the merits, but for what reason I don't know—I was not present; I suppose the record would show; I never examined it.

8. Cross-q. Were you, as counsel for defendant, prepared to try said cause, had the complainant desired a trial?

1040 Ans. I was retained and paid to argue the cause if it came to trial; but it did not come to trial.

9. Cross-ques. Upon what special matter did you, as counsel, most rely in the preparation of this case?

Ans. I had made up my mind that the strongest reliance I had was that stipulation made by M'r Sayles in the case with me, coupled with my evidence, to show that Thompson & Batchelder were experimenting at the time that Nichol's brake, as an independent invention, was stipulated to have gone into use. I suppose at the time that that stipulation was correct; I did not desire to take any improper advantage of M'r Sayles; he proposed to make it, to save the trouble and expense of taking evidence, and I accepted his proposition. I thought that an admitted fact like that in the case was a better reliance than any disputed evidence, and hence I relied most upon it.

10. Cross-ques. Did you consider the evidence as taken in that case sufficient to warrant you, as counsel for defendant, to go to trial?

Ans. Yes, I was willing to go to trial; it was the best case I could make up, so I thought that I would make the most of it if it came to trial,

11. Cross ques. Are you at the present time counsel for the Philad'a, Wilmington & Balt. R. R. Co.?

Answer. I never was the standing counsel of that company, but they occasionally employ me in patent cases and references of patent matters, and in business at Washington; but I have no case at present of theirs on hand.

12. Cross-ques. Did you consider from the evidence that Batchelder & Thompson were experimenting on brakes in the year 1847?

Ans. Yes; I thought I had established that pretty clearly.

13. Cross-ques. Were they in 1848?

Ans. I think, I thought at that time, that their experiments did run into 1848.

14. Cross-ques. Did Godfrey King testify in the Philadelphia case? If so, what did he testify?

1041 Ans. Yes, he did testify that they were experimenting on the lower road in 1848; it strikes me that there was a great deal of testimony taken on that subject, particularly on the complainant's side, and that I tried to establish a state of experiments, and he tried to establish a perfected brake, and that I also, on the defendant's side, tried to establish a state of experiment.

15. Cross-ques. Did Godfrey King testify that Batchelder and Thompson put their brake on the lower road with large push-rods?

Ans. Yes, he did say that.

16. Cross-ques. In what year did he say this was done?

Ans. He said it was done in 1848.

17. Cross-ques. Who was President of the Philadelphia, Wilmington and Balt. R. R. Co. when you prepared defendant's case for trial?

Ans. S. M. Felton was president.

18. Cross-ques. Was he ever connected with the Fitchburg road?

Ans. I think it appeared in the testimony taken in Boston that he was the superintendent of the Fitchburg road when Batchelder & Thompson tried their experiment on brakes.

19. Cross-ques. Did M'r Felton ever state to you that they put the brake on the Fitchburg road with push-rods, as alluded to in Godfrey King's testimony?

Ans. I don't recollect that M'r Felton ever stated that to me, as to the details of the brake; he told me that he considered it a failure; it was taken off, I believe. I will state here, as a matter of justice in this matter, that it appeared that the brake was made to operate both by hand from either end of the car, and also by a bumper, for the cars to operate against by the retardation of their motion, causing them to bear against each other, and the question was whether or not the hand arrangement was successful, even though the bumper arangement might be discarded, or whether the whole thing taken together was successful or not successful, and I prepared the case on that compound question.

M'r Felton was clear in his expression of opinion to me; taking
1042 it altogether that it was not satisfactory to him; he never expressed any opinion to me as to separating the hand arrangement from the bumper arrangement, and I do not know that that view of the matter had ever been brought before him. It was clearly established, I believe, that the bumper arrangement never did go into use.

20. Cross-ques. What of the hand arrangement?

Ans. The hand arrangement certainly did involve the principle contained in the Tanner patent, there could be no question of that, and therefore I had to put the case upon the test of experiment or non-experiment, as related to other circumstances involving the same principles.

21. Cross-ques. Did the Millholland brake involve the principle in the Batchelder & Thompson brake?

Ans. It involved the general idea of operating on both trucks from either end of the car, but it had a drum instead of the centre lever, and it was not repeated, but its use was discontinued, and there in it I had to contend with a condition of experiment, not repeated, not put in general use, not so practical as the rod of the lever, in the Thompson and Batchelder or Tanner patent, and the drum was not capable of multiplying the power, while the lever was; this capacity to multiply the power is an important feature in the application of the principle, and therefore, as between them, I had all these difficulties to contend with, and that is why I mainly relied upon that stipulation in the case.

22. Cross-ques. Do you wish to have it understood that the Millholland brake is not capable of being made to multiply power, both between the trucks and in the trucks?

Ans. The Millholland brake, as made, had the drum of uniform diameter throughout its length, and therefore that could not multiply power between the trucks; but by making the drum smaller in diameter at that portion from which it communicated the power to the trucks than at that portion from which it received the power from the windlasses, it could be made to multiply power between the trucks. I think it
1043 had the ordinary levers or fixtures between the trucks themselves
similar to the single-acting brakes, which, of course, multiply the power within the trucks. The general intent and object of the Millholland brake, so far as related to operating on both trucks from either end of the car, was certainly the same as in the Tanner brake; but the means employed to carry it into effect were very different, and that raised the question of experiment and abandonment in regard to it, as it was not continued in use.

Re-examined by M'r Cozzens:

31. Ques. In the Philadelphia suit, was it deemed advantageous by the defence to make any use of the information which you had previously obtained from Talson in the Hudson River suit?

Ans. No, that was considered of no account whatever. There was no testimony taken about it.

32. Question. How near to the time when the Dripps reply bears date, did you receive it, and in whose possession has it been since?

Ans. I received in the usual course of the mail a few days after its date. It has been in my possession ever since in the file of the case kept by me.

33. Ques. About when was the interview which you had with Lockwood prior to the time when you received the reply from Dripps?

Ans. It was in December, 1859, or January, 1860.

W'M W. HUBBELL.

Sworn to and subscribed before me this tenth day of June, A. D. 1868.

W'M GRIER HIBLER,
U. S. Commissioner.

1044 COMPLAINANT'S EXHIBIT.—DRIPPS' NEW PROOFS.

PITTSBURGH, FORT WAYNE AND CHICAGO RAILROAD COMPANY,
MASTER MACHINIST'S OFFICE,
Fort Wayne, Jan. 31st, 1860.

W'M W. HUBBELL, Esq., *Philadelphia:*

D'R SIR: In reply to yours of the 18th, in regard to the double-acting brake, is that the first I knew of them was when used on the Camden and Amboy R. R. Co.

M'r Lockwood, of Bordentown, N. J., foreman of car shops, C. & A. R. R. Co., will give you all of the required information. Hoping it will prove satisfactory, I remain,

Yours, respectfully,

ISAAC DRIPPS,
Per W. A. DRIPPS.

1045 CHICAGO, *October 12th*, 1868.

Present, complainant in person, and M'r Blodgett, defendant's counsel.

CHARLES H. FRISBIE, being first duly cautioned and sworn, deposeth and saith:

Int. 1. What is your name, age, residence, and occupation?

A. My name is Charles H. Frisbie; my age is 46 years; I reside in Rockford, Ill.; my occupation is locomotive engineer.

Int. 2. Were you ever in the employ of the New Jersey Railroad and Transportation Co.? If yea, at what time and in what capacity?

A. I was in the employ of the New Jersey R. R. & Trans. Co. between the years of 1846 and 1849. I was employed about three years, but cannot give the precise dates. I was employed as fireman.

Int. 3. On what trains were you employed as fireman?

A. On the New York and Philadelphia train; the New York and New Brunswick. I was about a year on the New York and Rahway train, and about a year on the New York and Philadelphia train. I was on other short trains besides these.

Int. 4. While you were so employed on the New Jersey Railroad, do you know what kind of brakes were used on the passenger and baggage or crate cars? If yea, please state whether they were single-acting brakes or double-acting brakes.

A. They were what were called a single-acting brake; they broke from one pair of trucks.

Int. 5. Please explain what you mean by one pair of trucks.

A. Well, I mean one truck of four wheels; some cars have eight wheels on a car and some have twelve wheels.

Int. 6. While you were so employed on said New Jersey Railroad
could there have been any double-acting brakes, operating the
1046 brakes on both trucks from a windlass at either end of the car,
used for any length of time, on said railroad and you not have
known it?

A. I think not.

Int. 7. During the time while you were employed on said New Jersey Railroad, were there any cars belonging to the Camden and Amboy Railroad Co. in the trains on which you were fireman?

A. There was. The Philadelphia trains were, most of them, Camden and Amboy cars—I do not know but all of them.

Int. 8. Did you, while in the employ of said New Jersey R. R. Co., know of a car called the John Tyler car?

A. There was such a car there; yes, sir.

Int. 9. Did you ever see that car? If yea, when, and about how often, as near as you can remember?

A. I have seen the car. I think I saw it at two different times. Once was when Henry Clay went over the road, and once when President Adams—I think it was John Adams—died and was taken to New York. I have frequently seen the car in the Philadelphia trains.

Int. 10. You say you have frequently seen it in the Philadelphia trains; who was fireman on those Philadelphia trains you speak of?

A. I was one; a man by the name of Cha's M. Cleary, now dead; William Pierson, and a boy by the name of Weare. They called him Bub Weare. I do not know what his name was.

Int. 11. About how often, as near as you can recollect, did you see the Tyler car in the Philadelphia trains, and in what year or years was it?

A. I saw the train nearly every day, but how often I saw this particular car I could not say. Perhaps twice a week and perhaps oftener. I saw it the most in 1849, or the last year I was there, as I was on this train.

Int. 12. Do you know the difference between what is known as a double-acting brake and the single-acting brake? If yea, please state the difference.

A. Yes, sir; I think I do. I have used them long enough; I
1047 ought to. All the difference there is, is that a single brake brakes
from one set of four wheels, and the double-acting brakes from the eight wheels. I mean that the single brake holds four wheels and a double brake holds eight wheels from the same purchase or windlass.

Int. 13. Do you know what kind of a brake the Tyler car had on while you knew it, during the time you were on the New Jersey road? If so, please state it.

A. I do not know of any except a single brake while I knew it.

Int. 14. When and where did you first see a double-acting car-brake on a car?

A. The first I ever saw was on a car in Detroit, Mich. This was some 3 or 4 years after I left the New Jersey R. R.

Int. 15. Was the brake on the Tyler car different from the brakes on the other cars you saw, belonging to the Camden & Amboy Company?

(Question objected to. Question withdrawn.)

What kind of brakes were on the other cars belonging to the Camden & Amboy Co. that were run in the trains with the said Tyler car?

A. I never saw any except the single-acting brake.

Int. 16. Could there have been any double-acting brakes used on the Tyler car or other cars belonging to the Camden and Amboy road that run into Jersey City during the time you were running on the Philadelphia trains, for any length of time, and you not have known it or seen it?

A. I think not.

Int. 17. Were you in the habit of noticing particularly, during that time, any new improvements that were being put on or used on the cars?

A. No further than the Philadelphia coaches were the nicest coaches. They were differently constructed. I do not know as I did then notice any particularly new improvements. I have generally noticed new im-
provements. The reason I noticed these cars were, first, they were
1048 all or nearly all lettered, and the seats were all numbered in the
inside of the car, and they had a centre door in the centre of the coach.

Int. 18. Please describe the Tyler car as near as you can.

A. The Tyler car was intended to be at this time about the same as a directors' car now, a little nicer car and nicer-running car than the others. I do not recollect that I ever was inside of the car. I think there was a saloon or privy on the platform.

Int. 19. After you left the New Jersey road where and in what capacity have you been employed?

A. I have been employed in the capacity of engineer, as locomotive engineer and as steamboat. I have worked for the Mich. Central R. R. Co. some 16 or 17 years. I have worked for the Burlington and Quincey Company about two years, the Chicago, Pittsburg and Ft Wayne about one year, the Chicago and Northwestern going on three years, and am now in their employ. This is as near as I recollect.

Int. 20. Please think the matter over, and state how many years it is since you left the New Jersey Transportation Company.

A. Well, sir, I do not know as I can state the exact time without referring to my books.

Int. 21. Are you positive as to the number of years you were on the Mich. Central road?

A. I am not.

Int. 22. How positive are you that you left the New Jersey road some time in the year 1849?

A. I am not positive what year I left there. I was there when Timothy L. Smith was sup't. I am not positive of the year I went there or the year I left. As near as I can figure it in my head I left there some twenty years ago. I was there the year of the famine in Ireland, and the year Henry Clay and John Adams went over the road.

Int. 23. You say you were on the Mich. Central R. R. some 16
1049 or 17 years, the Burlington and Quincey about two years, the Pittsburg and Fort Wayne about one year, and the Northwestern going on three years, which would make about 23 years; please explain anything you wish to in regard to this.

(Question objected to by H. W. Blodgett.)

A. The explanation I wish to make is simply that I have probably made some mistake in the time I worked for the Mich. Central R. R.; the other companies is more recently, and I can keep it in my head better.

Cross-examined by H. W. Blodgett:

1. Cross-int. At whose instance did you come here as a witness?

A. This gentleman (pointing to M'r Sayles).

2. Cross-int. When did he request you to come here?

A. This afternoon, as I saw him this forenoon between 11 or 12 o'clock a. m.

3. Cross-int. Where did you meet him?

A. At 82 S. Green street, Chicago, Illinois.

4. Cross-int. How did you happen to be there?

A. I came from Clinton, Iowa, last night, and was out all night, and this is my boarding place.

5. Cross-int. Did M'r Sayles call upon you there?

A. Yes, sir.

6. Cross-int. What did he tell you he wanted of you?

A. He told me he wanted I should come down and state what I knew about the brakes that were used on the Camden and Amboy cars.

7. Cross-int. Who did he tell you had referred him to you?

A. A man by the name of Hutton and a man by the name of Duncan.

8. Cross-int. Had you, as fireman on the New Jersey Road, anything to do with the peculiar form or kind of brakes on the cars?

A. I had nothing to do with the brakes on the cars.

1050 9. Cross-int. You say you know the Tyler car well; how many wheels were there under her.

A. She was what is called a twelve-wheel car.

10. Cross-int. What kind of springs had she?

A. A spring similar to half of a buggy spring over each wheel.

11. Cross-int. Was that all the springs she had?

A. The other coaches had different springs; I do not recollect any other on this.

12. Cross-int. Were there any other 12-wheeled cars on the Camden and Amboy road except the John Tyler car?

A. I do not recollect of any.

13. Cross-int. Did you know M'r Lockwood, the master car-builder, of the Camden and Amboy road?

A. No, sir; I did not.

14. Cross-int. Would not the master car-builder of the Camden and Amboy road be apt to know the kind of brakes used on that car better than yourself?

A. I think he would—yes, sir; as he made that his business.

15. Cross-int. Did you go directly from the New Jersey road to the Mich. Central road?

A. I started from New York City and went to Cayuga County, New York; I staid there, perhaps, two weeks, and then went to work for the Mich. Central R. R.

16. Cross-int. You say you did not see any double-acting brake until you had been on the Mich. Central road some three or four years. What kind of a double-acting brake was that?

A. I do not know as I could explain every part of it, although I know very well what it was; there was a lever in the centre of the car, underneath; when you turned the brake wheel on the end of the car it acted on eight of the wheels.

17. Cross-int. Was this the first time you had ever heard of a double-acting brake?

A. Yes, sir; this was the first time I ever knew anything about a double-acting brake.

1051 18. Cross-int. How far, and between what points, did you run as fireman on the New York and Philadelphia train?

A I ran from Jersey City to New Brunswick. I think 30 to 31 miles. I do not know the exact distance.

19. Cross-int. You say Henry Clay passed over the road in the Tyler car; was that before or after he ran for President, or was it the same year?

A. I am not positive that Henry Clay rode in that car, but I meant to say that car was in the train. I should think it was before he ran for President, but I am not positive whether it was before or after.

20. Cross-int. Do you run a freight or passenger train now?

A. Either one. I run both, sometimes one and sometimes the other.

21. Cross-int. What kind of brakes do they use on the passenger cars of the Northwestern road now?

A. I think that the majority of them are what are called the double-lever brakes.

22. Cross-int. Why do they call them double lever brakes?

A. Because they are levered at both ends of the coach.

23. Cross-int. Are there any levers under the coach?

A. That is what I mean; they are under the coach between the trucks.

24. Cross-int. You never heard of double brakes of any kind while on the New Jersey road, did you?

A. I never did. No, sir.

(S'g'd) C. H. FRISBIE.

Subscribed and sworn to before me this 12th day of Oct., 1868.

P. A. HOYNE,
Examinur.

1052 CHICAGO, *October* 14*th*, 1868.

Present, complainant and M'r West, his counsel, and M'r Blodgett, def't's counsel.

PATRICK H. FLANNEGAN, the witness introduced, cautioned and sworn, deposeth and saith:

Q. What is your name, age, residence, and occupation?

A. My name is Patrick H. Flannegan. 36 or 37 years of age. I reside in the city of Chicago. Am a railroad engineer. I have been in the employ of the N. J. R. R. and Transportation Co. I should think it was about 23 to 24 years ago. I was fireman on a locomotive engine. I was with Abraham Condict, engineer. I worked for the company three years and nine months. During this time M'r Talson was sup't of car repairs part of the time, and M'r Baker came in as sup't after Talson left. I think Baker came a year before I left. While I was in the employ of the said company I saw a car called the John Tyler on the road, which belonged to the Camden and Amboy Co. I remember that this car had a privy on one of the platforms, and had six wheels on each truck. It had a brake on each end, the same as any other cars. I have operated the brakes on the said car—this I have done for merriment. I would on being asked by some of the switchmen, pull the pin to let this car loose from the other part of the train. I would jump on the car and operate the brakes. I would leave the car door open and operate one end, then run through the car and operate the brake on the other end. I saw this John Tyler car sometimes once a week, sometimes twice a week, sometimes once a day, and sometimes not at all for a week. I frequently noticed this car, the wheels, trucks, and brakes; when I set the brakes on one end of the car it did not operate on both trucks, but only on one. I saw this Tyler car after M'r Baker came onto the road and from time to time during the whole period I was at work for the company, as I have mentioned, 3 years and 9 months. The brakes of the two trucks were not connected
1053 together in any manner. I did not lose a day in the 3 years and 9 months I worked for the company. After this time I left the road for a year and went to Wisconsin, and then went back on that road again. I got onto the John Tyler car perhaps as often as twice a week to operate the brakes, sometimes oftener and sometimes not so often. I was employed on a freight and passenger train. This Tyler car did not run on our train, and the reason I would jump onto the car was that our engine would be standing and waiting for this Philadelphia train to pass which had the Tyler car on, and I would jump on and pull the pin and work the brakes. I am now in the employ of the Chicago and Northwestern Company. I have been in their employ 4 years, I think, the ninth day of last July. M'r Sayles first talked to me about coming here to give my evidence; it was yesterday morning about eleven o'clock. I had a talk with M'r Blodgett after this. I got a telegraph dispatch yesterday about eleven o'clock a. m. to come to M'r Blodgett's office—the dispatch was from M'r Tilton, the master mechanic of the N. W. road, Galena div., and to come right away. I asked the gentleman what it was for; he said he did not know. This was the yard-master that gave it to me, and he said I must go right down town. I said to him, I do not know what this can be for; that I had not done anything that they wanted me there for; and as I was looking at it at the corner of Canal st., this man, M'r Sayles, came along and asked me if my name was M'r Flannegan. I told him yes, sir. He asked me if I was from Jersey City; and I told him yes, sir. He said he was acquainted with some of my friends in Jersey City; that he had seen them. He asked

me if I was acquainted with M'r Hutton. I said yes, sir. He asked me if I was acquainted with M'r McFarland. I told him I was. He asked me several other questions, but I told him I would like to be excused, as I had a telegraph from the company's lawyer, and must go down to his office, but if he would come around to-morrow morning I would like to have some further conversation with him. I told
1054 him I would go up to my house and change my clothes and go down to M'r Blodgett's office. M'r Sayles said he would go with me down there. So I got on some clean clothes and got into a street-car. And he asked me if I knew anything about this Tyler car. I told him I did. I told him I pulled the pin several times to cut it loose. This was all that passed between us. M'r Sayles and myself went to M'r Blodgett's office.

Question. Now, I want you to state the conversation you had with M'r Blodgett in his office.

(Objected to by M'r Blodgett.)

A. When I went into M'r Blodgett's office he was not in, and M'r Sayles and me waited until he did come in. M'r Blodgett came in and M'r Sayles introduced me to him. I do not remember what passed more than an introduction. M'r Sayles and M'r Blodgett had spoke to one another; the rest of the conversation I did not pay any attention to.

What did M'r Blodgett say to you about your testifying in this case?

(Objected to by M'r Blodgett.)

The witness says that he does not wish to make any trouble, and refuses to answer the question.

Q. Did M'r Sayles request or wish you to come here yesterday to testify?

A. Yes, sir.

Q. Why did you not come?

A. M'r Blodgett told me that unless I was sent for I need not come until to-day.

Q. Does the three years and nine months include any time after you went back from Wisconsin?

A. I worked three years and nine months before I went to Wisconsin. I stopped in Wisconsin for one year and then went back and worked for the company six or seven years more.

1055 Cross-examined by M'r Blodgett:

How old did you say you are?

36 or 37, I do not know which.

Had you had any conversation with any one about the Tyler car before M'r Sayles spoke to you about it?

No, sir, I had not. I had not thought about it; the kind of brakes had never been talked about up to the time M'r Sayles spoke to me about them. I have looked under the car to see how its brakes were made. I looked the car all over. They were single brakes. I saw some double ones on the road during the time I mentioned, three years and nine months; they were on a flat freight-car; they were put on under the charge of M'r Baker. Talson had nothing to do with putting on these brakes to my recollection. The double brake was put on after the time Talson left and the time I came to Wisconsin. I did not examine this brake, more than I made a little fun of the brakeman that was using it.

I mean by a single brake, a brake at each truck. The brake-wheel on the Tyler car had no ratchet. When I put the brake on I had to hold it with my hand, and when I let go of one end it would let go what

it held until I could go to the other end. I am positive they were single brakes, because I could screw up one end and the other would be entirely at liberty. I know it was at liberty, because anybody could have got up and tried it. I know it was at liberty, for I tried it and found it at liberty. I could not be at both ends of the car at once. When I would screw up one end and run to the other I would find it at liberty; there was no pawl and ratchet at either end of the car. I do not remember whether the Tyler car was on the road when I came back from Wisconsin. I paid no attention to it. I do not say that the Tyler car ran regular every day. I only say that it ran once or twice a week. I had no interest in the car. It was a handsome car, and a privy on one end of it, which made me look to it more than anything else. The Tyler car was the name it went by. It was in everybody's mouth.
1056 I do not remember whether the name was painted up anywhere on it. This Tyler car could not have had double brakes on it and I not have known it, even if they were different from what I have seen since. I first noticed the double-acting brakes after I went back from the West. I did not take much notice of them. I never frequented the cars much. I continued as fireman after I went back on the road again. I did not tell you yesterday that there was a flat car on which Talson put a double brake, nor that Talson tried some experiments with; I said it was Mr. Baker; if I did, you misunderstood me. I cannot describe any double brake now in use. I have not paid much attention to it. I do not know what brakes the Northwestern use on their cars. I was four years from last July in the employ of the N. W. road and since then. Previous to this I had been on the C. and R. I., now called the C., R. I. and P. I was on the New Jersey Central after I left the New Jersey R. R. & Trans. Co. I had no knowledge what kind of brakes they had in use on the Rock Island pass. cars; I had no intercourse with them. My business was in the round-house, switching. The passenger-cars were not standing round the yard where I was switching; they never came there.

The difference between a single brake and a double is that one is a single brake and the other is a double brake. A single brake is on each end, or has a windlass on each end, of the car; double brakes are connected.

I know there was no rods on the Tyler car to make connections. I could see it passing by that there were no rods; I never thought of looking for any. I never thought of the matter whether the Tyler car had single brakes or double brakes since I left Jersey City, until M'r Sayles spoke to me about it yesterday. I heard the brakes talked about while I was in Jersey City by M'r Condict, the engineer I was with, whether single or double, on the Tyler car. I was with M'r Condict before I went to Wisconsin. I do not know anything about the Tyler car after I went back to Wisconsin; I paid no attention to it. I was
1057 about 11 or 12 years of age when I went to work for the New Jersey road. I was very young. I then worked for them three years and nine months, when I went to Wisconsin. I do not remember what M'r Condict said about brakes on the Tyler car.

Redirect:

You have stated on your cross-examination that you first noticed a double-acting brake after you went back from the West. State, if you can, how long it was after you went back from the West before you first saw the double-acting brake?

I have not got any memory of it.

You are sure, are you, that you did not see any double-acting brakes until after you went back from the West?

Yes, sir.

Was the first that you saw the one put by Baker on that flat car you mentioned?

Yes, sir.

How many trucks does the single brake act upon from one windlass?

One, sir.

How many trucks does a double-acting brake act upon from one windlass?

Two.

What is your business on the Northwestern road?

I am running a switch engine at the south branch; there are no passenger-cars of the N. W. Company come there; only occasionally when they go to the pier, or pass through there; they do not stop there; they stop there a minute or two until a switch engine comes to take them away.

Did M'r Blodgett talk to you yesterday about the Tyler car?

(Objected to by M'r Blodgett.)

Yes, sir.

1058 Did he have any other business with you except that?

No, sir.

Recross:

You say in your cross-examination that the flat car put on the New Jersey road by Baker, with a double brake, was put on before you went to Wisconsin; is that right?

Right, sir; a couple of months before I left.

Redirect resumed:

May you not be mistaken as to the time when you first saw the double-acting brake on the flat car?

I have no record or minutes of it; but I do not think I am very far out of the way.

Might it not have been after you got back from Wisconsin that you first saw it?

I cannot answer that question correct.

(Signed) P. H. FLANAGAN.

Subscribed and sworn before me 14th day of October, 1868.

P. A. HOYNE,
Examiner.

PHILADELPHIA, *Oct.* 17, 1868.

Present, S. D. Cozzens, counsel for complainant, and the complainant in person, and S. M. Whipple, counsel for defendant.

CHARLES YUNDT, a witness on the part of the complainant, being duly sworn, deposes and says:

1. Have you been examined before as a witness in this case?

1059 A. I have.

2. Are you acquainted with W'm Quigley, who is an engineer on the Camden and Amboy R. R.?

A. Yes, sir.

3. How long have you known him?

A. From the best of my recollection I have known him since 1843 or 1844, up to the present time.

4. In the year 1843, was said Quigley employed on any R. R.; if so, what R. R.?

A. I cannot tell the exact year, but he was on the Camden and Amboy R. R. as brakeman. He was an extra brakeman, not employed by the Co., but by the men that wanted him.

5. You spoke in your former testimony in this case, of running excursion trains on the Camden and Amboy R. R. State whether said Quigley had anything to do on any of said trains; and, if so, what did he have to do?

A. Yes; he was a brakeman on those trains. He had to attend the brakes as an extra hand.

6. You say he was paid by the men when they wanted him. How did they come to want him?

A. Some of them would be sick, or something of that kind.

7. Was he sometimes employed by the men on the road, when they were away from the road, from other causes than sickness?

A. Yes; he took their places.

8. In your former testimony in this case, you spoke of a rod falling down on a car in one of the excursion trains referred to; will you state whether, since your former testimony was given, you have examined any cars on the Camden and Amboy road; and, if so, have you anything to explain in relation to this rod?

(Object to any further cross examination of the witness at this state of the case.)

A. I have examined cars. I found after examining the cars
1060 that it was different from what I stated in New York. I found
it was not the same model brake that they showed me in New
York; one of the bolts come out of the rod of this brake I am speaking of now. It was the forward truck on the car going towards New York. I had to stop and put another bolt in. There was a brake on each truck on each end of the car, and each truck braked by itself.

9. Please describe how that rod was placed in the truck, and if it was connected to any lever please state how and where that lever stood in the truck.

A. The lever did not lay flat; it stood up in the truck somewhat inclined; one rod was connected on the top of this lever; the other end of this rod was connected with the crank. There was another rod on the other end of the lever, went to the forward brake in the same truck.

10. Which one of these two rods was it which fell down?

A. The top one.

11. You say there was a brake on each truck on each end of this car on which the rod fell down, and that each truck was braked by itself. At that time, what were brakes rigged in that way called on the Camden and Amboy Railroad?

A. They were called double brakes.

12. Were these so-called double brakes connected so that both trucks could be braked from one end of the car?

A. I think they did not.

13. What was the first car on the Camden and Amboy road, so far as you know, "that had these double brakes;" that is, brakes on each end of the car, but not connected?

A. The Tyler car was the first that had two brakes on.

14. About what year did you first know of the Tyler car having this kind of double brakes on it?

A. In 1843.

15. After the Tyler car came out in 1843 with this kind of double

brakes on it, were other cars on the Camden and Amboy road fitted with brakes in the same manner?

A. I think not. I think they were all with single brakes.

1061 16. Will you state whether since your former testimony in this case you have thought over the subject of it, and if so, will you please state in what year it was that you first knew of the use on the Camden and Amboy cars, of the double-acting centre lever brake operating on both trucks, from one end of the car, like the model, Exhibit A, shown you in N. Y.?

A. Yes; I did think the subject over some in 1850, 1851, or 1852. I can't tell exactly about that.

Cross 1. The rod that fell down, and which you put up in its place by a bolt from your tool chest, dragged on the ground, did it, until you put it up in its place?

A. One end dragged on the ground.

Cross 2. Was the lever which you say was in the truck, was it in the back part of the truck from the crank, or in the front part of the truck nearest the crank?

A. Neither one.

Cross 3. Was it under the body of the car?

A. No, sir.

Where was it?

A. It was fast to the brake.

Cross 4. Was the lever in the end of the truck next to the crank or in the end of the truck nearest the centre of the car?

A. The lever was in the end nearest the centre of the car.

Cross 5. How was W'm Quigley employed when not engaged by some of the men, as you say he was, as extra hand?

A. He was not employed at all that I know of when he was not employed extra.

Cross 6. Was he a boy in 1843?

A. He was 16 or 17 years old; I suppose somewhere along there.

Cross 7. Was he a boy given to hunting or fishing when not employed?

A. I don't know for certain.

Cross 8. Was he in the habit of going to school?

1062 A. Not that I know of.

Cross 9. If you know, state how Quigley's father employed his time.

A. He followed fishing and gunning.

Cross 10. Did his father support his family in that way?

A. I believe he did.

Cross 11. Did he sell the fish and game he caught in the market where he lived?

A. I don't know.

Cross 12. Did W'm Quigley fire for you; if so, what time?

A. I can't tell that.

Cross 13. Did he fire for you in 1843?

A. I think not.

Cross 14. Did he in 1844?

A. I think he did not.

Cross 15. In 1845?

A. I don't remember that he fired for me at all.

Cross 16. How clear are you that he did not fire for you at all?

A. I can't tell, it is so long ago. I generally had my own regular fireman.

Cross 17. Did W'm Quigley brake on passenger trains run by you in 1843 and 1844?

A. He did, somewhere along there, between '43 and '45.

Cross 18. How much of the time?

A. Sometimes once a week and sometimes twice.

Cross 19. In succession, weeks through the year; if not, about how often?

A. The only times he braked for me was when we run the excursion trains—about two months in the year.

Cross 20. How much of these excursion trains did he brake?

A. I can't tell you. He did not brake every trip we run.

Cross 21. Then he only broke when some brakeman was sick or away?

A. Yes, sir.

1063 Cross 22. And paid by the brakeman?

A. Yes, sir.

Cross 23. Do you know M'r Sayles, the complainant in this case?

A. I know him when I see him, that is all.

Cross 24. Has he talked over this matter of brakes with you?

A. Yes.

Redirect cross 1. Please explain how the end of the rod which you have spoken of could fall down on the car on the excursion train?

A. It couldn't help but fall down after the bolt came out; it fell down outside of the truck, by the side of the truck.

Recross 2. You are sure, are you, that the body of the car was so attached to the truck, and the rod to the lever, that it would fall outside of the truck and track if detached from the lever?

A. The car body was attached to the centre of the truck.

Recross 3. Was the car body made to rest on side bearings on either side of the centre?

A. It was to keep the car from rolling.

Recross 4. Did this rod from the crank to the lever pass between the centre and one of these bearings?

A. It did.

CHARLES YUNDT.

Subscribed and sworn to before me this 17th day of Oct., 1868.

W. GRIER HIBLER,
U. S. Commissioner.

PHILADELPHIA, *Oct. 16th*, 1868.

BENJAMIN T. SEWARD, a witness on the part of the complainant, being duly sworn, deposes and says:

1. What is your name, age, residence, and occupation?

A. My name is Benjamin T. Seward; 47 years of age; residence, Philadelphia; am locomotive engineer.

1064 2. Were you ever in the employ of the Camden and Amboy R. R. Co., and if so, in what capacity and how long?

A. I was in their employ. I commenced in Aug., 1840, as brakeman. I was brakeman over two years. I was then fireman a little over two years. I was then raised to an engineer, and I continued as engineer until 1850 or 1851. I then left that road and went on the Harlem road, N. Y.

3. While you were employed on the Camden and Amboy R. R., did you know of a car on that road called the Tyler car?

A. I did.

4. Was that car different from the other cars on that road, in any respect; and, if so, will you state some of the differences?

A. It was a little different; there was a saloon or privy on the outside on one of the platforms, the car was got up in very good style, better than the other cars. John Tyler rode in it after it was rebuilt.

5. During how much of the time you were employed by the Camden and Amboy R. Road Co., as you have stated, did you know of this Tyler car?

A. Sometimes I would see it every day, and then I might not see it for a month or two. I knew of it in this way for years.

6. Did you see it when it was rebuilt in 1843?

A. I did see it.

7. Will you please state, if you know, what kind of brakes, whether single brakes, acting on only one truck, or double brakes, acting on both trucks from one windlass, were upon this Tyler car during the time you knew of it on the Camden and Amboy road, as you have stated?

A. I could not say; but my opinion is that they were single brakes, and I have no recollection of seeing any double brake anywhere before 1853, when I saw one on the N. Y. and New Haven road, where I was employed.

1065 8. How frequent opportunities did you have while you were on the Camden and Amboy Railroad of knowing what kind of brakes were on the Tyler car?

A. Sometimes I had an opportunity five or six times a day, and then again I might not see the car for a month. I sometimes saw the car five or six times a day. I saw it often at stations when it was in my train.

9. Was it in your train often?

A. It was. I sometimes ran it for three or four weeks right along.

10. Do you think that there could have been a double brake on this Tyler car for any length of time while you knew of it on the Camden and Amboy road without your being aware of it?

(Objected to.)

A. I think it could not.

11. Do you know W'm Quigley, who has been employed on the Camden and Amboy R. R. for many years past?

A. I do.

12. When did you first make his acquaintance?

A. About the year 1840 or 1841. He was a boy then.

13. When did you first know of his being employed on the Camden and Amboy R. R.?

A. I can't say what year. It must have been before 1844. I think it was before 1844.

14. What was he doing on the road before 1844?

A. He was an extra man, braking extra and firing extra; when a man was sick or wanted to be off for a day or a week, he would hire him in his place. The company did not employ him when he first went on the road; while he was an extra hand the men hired him.

15. While he was on the road as an extra hand, did you see him often?

A. I did.

1066 Cross-examination:

Cross 1. You say you were acquainted with William Quigley about the year 1840 or 1841; under what circumstances or on what occasion did you become so acquainted?

Answer. Well, I knew him as laying round the road, wanting to get on for a job of some kind.

Cross 2. Question. When not laying round the road, as you say, how did he employ his time?

Answer. Well, I suppose he done odd jobs round one place and another, and he went fishing and gunning a good deal.

Cross 3. Question. Do you know from personal inspection of the Tyler car, on the day it took President Tyler over the road, and do you know from such inspection the kind of brake on said Tyler car, whether double or single?

Answer. I do not. I did not inspect.

B. T. SEWARD.

Subscribed and sworn to before me this 16th day of Oct., 1868.

W. GRIER HIBLER,
U. S. Commissioner.

Joseph Herbert, a witness on the part of the complainant, being duly sworn, deposes and says:

1. What is your name, age, residence, and occupation?

A. Joseph Herbert; 58 years of age; reside in Bordentown, N. J. I am employed on the Camden and Amboy R. R., working by days' work repairing the road.

2. Were you ever employed as a brakeman on the Camden and Amboy R. R.; and, if so, when?

A. Yes. I commenced there when the road first commenced, if you can find out when that was. I used to run on the excursion and mail trains.

3. About what year was it, as near as you can tell, when you commenced being brakeman on said railroad?

1067 A. I can't tell what year it was when the road first commenced when the cars were drawn by horses. This was a year or two before the engines came on.

4. Do you remember a trip made by President Tyler over the Camden and Amboy R. R.?

A. Yes, sir.

5. Were you employed on the road at that time?

A. Yes, sir.

6. How?

A. On the brakes as brakeman.

7. Did you see the car in which Tyler made his trip?

A. Yes, sir.

8. When did you first see it?

A. A year or two before Tyler rode in it; a year, I think; that was in 1843 that Tyler rode in it.

9. Did you see this car at the time Tyler made his trip in it in 1843?

A. Yes; I saw the car the day he made his trip.

10. Do you know what kind of brakes this car had at that time, the time he made his trip; if so, what kind of brakes were they?

A. Yes, sir; there was a brake on each truck, and it took two men to brake both trucks; that is, if we wanted to brake both trucks at one time; else we would have to run through the car to do it.

11. What name did this car go by after Tyler made his trip in it?

A. It went by the name of the Tyler car after he made his trip in it.

12. Can you mention some of the trains that this car run in after the time Tyler made his trip in it?

A. It generally run to Trenton; sometimes it run on excursion trains; sometimes it run on other trains.

13. Did you see it when it used to run to Trenton, as you state, and when it run on these excursion trains, and on these other trains?

A. I did.

14. About how frequently did you see it when it ran in those trains?

1068 A. I can't tell what trains it run in every day. I saw the car most every day.

15. What kind of brakes did this car have when you thus saw it?

A. It had a brake on each truck; they turned a crank around to wind up the chain.

16. How many trucks did the brake at one end of this car brake on at these times when you so saw it?

A. It broke on one truck.

17. When they wanted to apply the brakes of both trucks of the car at the same time, how many men would it take to do it?

A. It took two.

18. What name was given on the Camden and Amboy R. R. to brakes like those on this Tyler car, as you have described them?

A. I can't tell.

19. I mean what did they call those brakes on the Tyler car?

A. They called it the double brake.

20. Was there any connection between the two brakes on the Tyler car?

A. No, sir.

21. After the Tyler car was fitted with these two brakes that were not connected, were there any other cars on the Camden and Amboy road fitted with the same kind of brakes?

A. No, not as long as I was on the road.

22. Did you ever act as brakeman on the Tyler car?

A. Not to run steady, once in a while in the excursion train. I saw it most every day. I had to go around and hunt up the cars for the excursion trains.

23. Do you know how many trucks the brake at one end of the car brakes on in the passenger cars now used on the Camden and Amboy road?

A. One brake will brake on both trucks forward and aft; one lever attaches to both of the trucks.

24. After Tyler made his trip how long did you know of the Tyler car on the Camden and Amboy road?

1069 A. I wasn't long on the road after that. I left the road just before the excursion trains quit running.

25. How many years was this after Tyler made his trip?

A. It might be, as near as I can fix it, about two years after.

26. Was it during these two years that you used to see the Tyler car as you have stated?

A. Yes, sir.

27. Do you know W'm Quigley, who is an engineer on the Camden and Amboy R. R.?

A. Yes, I know him.

28. About when did you first get acquainted with him?

A. I have known him ever since he was a boy.

29. Did you know him at the time the excursion trains were run on the road?

A. Yes, sir.

30. Did he do anything on the trains at this time? If so, what did he do on the Camden and Amboy trains?

A. He broke once in a while when I was on.

31. What kind of trains was it that he broke on?

A. Sometimes on the excursion trains.

32. Was this before you left the road?

A. Yes.

Cross-examined by M'r Whipple:

Cross. 1. It being so long ago, may you not be mistaken as to the kind of brakes on the Tyler car when he took his trip over the road in it?

A. No, sir; I can remember that well enough. It had the only double brake that was on the road.

Cross. 2. Do they use the same kind of brakes on the passenger-cars on the Camden and Amboy road now that they did on the Tyler car when it took the President over the road?

A. No, sir.

Cross. 3. Were you brakeman on the Tyler car the day it took the President over the road?

1070 A. No, sir.

Cross. 4. How then do you know what kind of brakes were on that car the day it took the President over the road?

A. Why, I saw it.

Cross. 5. Was the so-called Tyler car run in trains of the Camden and Amboy road before it took the President over the road?

A. Yes, once in a while it run in excursion trains.

Cross. 6. Did you brake on this car before it took the President over the road?

A. Yes, sir.

Cross. 7. How long before it took the President over the road did you brake on it?

A. I can't tell that now.

Cross. 8. Do you think it was a month before?

A. O, yes, more than that.

Cross. 9. Do you think it was six months?

A. Yes.

Cross 10. Do you think it was a year before?

A. Yes, I guess it was.

Cross. 11. Did M'r Sayles tell you what kind of a brake was on the Tyler car when it took the President over the road?

A. No; I don't want anybody to tell me that.

Cross. 12. Has he talked with you about what brakes were on the Tyler car?

A. He has asked me about them, and I told him.

Cross. 13. What led you to examine the brakes on the car the day it took the President over the road?

A. I had to see to the brakes when I was on the road.

Cross. 14. At what place did you see the brakes on the Tyler car the day it took the President over the road?

A. At Bordentown.

Cross. 15. Was the President in the car at the time you examined the brakes?

A. He was in the car.

Cross. 16. Did you see the President when the car stopped at Bordentown?

1071 A. Yes, sir.

Cross. 17. Which did you see first, the brakes on the cars or the President?

A. I had to look at the brakes first.

Cross. 18. Were you inspector of cars at Bordentown at the time the President passed over the road?

A. No, I wasn't inspector of them.

Cross. 19. What were your duties?

A. I was a brake-tender on the road.

Cross. 20. Was you brake-tender on that day?

A. I had come in with our line before Tyler arrived at Bordentown.

Cross. 21. After having discharged your duty as brake-tender on this train, what had you further to do on that day?

A. I had the cars to clean, the brakes to attend to, and grease the journals and attend to them.

Cross. 22. You mean, do you, the cars and journals of the train of which you was brake-tender?

A. Yes.

Cross. 23. Did you have to attend to cleaning of all the cars, and look after all the brakes, and grease the journals of the cars that came to Bordentown?

A. What we run we had to do it.

Cross. 24. Did you run on the train the day President Tyler was taken over the road, that is the train in which he rode?

A. No, I was not on with him at all.

Cross. 25. Was it your business to look after the cleaning of the cars and the brakes and oiling the journals of the cars in the train which took President Tyler over the road on that day?

A. No, sir; I had nothing to do with that at all.

Cross. 26. On the arrival of the train at Bordentown, which had the President on board, was it your duty first to look to the brakes?

A. No; but when I came along I always cast my eye down on to them and on the wheels, too.

Cross. 27. You especially notice the brakes on the cars, do you?

1072 A. Yes, sir.

Cross. 28. Have you always had in your mind distinctly the brakes that were on the Camden and Amboy road for the two years before you left the road?

Ans. Yes.

Cross. 29. So that you could have told any one at any time since, had you been asked, what kind of brakes were in use on the Tyler car?

Ans. Yes.

Cross. 30. Is everything else connected with the Tyler car just as fresh in your recollection, and by that I mean the trucks, the springs, the seats in the car, and the color of the car?

Ans. Well, yes; I could tell you the color of the car. The car was red.

Cross. 31. Were the seats in the Tyler car the same as are now used in the passenger cars of the Camden and Amboy road?

Ans. They were a good deal like them. I think it was chairs they had in that Tyler car, but I wont be sure; it has been so long, it has slipped my memory.

Cross. 32. Were all the chairs alike in the Tyler car, whatever kind they were?

Ans. Yes; I think they were all alike.

Cross. 33. What kind of springs were in use on the Tyler car?

Ans. That has slipped my recollection, too.

Cross. 34. Did it have any springs?

Ans. Oh, yes, it had springs.

Cross. 35. Were they India-rubber springs?

Ans. Well, I don't know. I had nothing to do with the springs and such things. I had to do with cleaning the cars, and with the journals and the brakes.

Cross. 36. Do you mean by the brakes, the blocks that press against the wheels?

Ans. I had the blocks that press against the wheels to leather. I had to do with the whole brakes.

Cross. 37. How many trucks were there under the Tyler car?

1073 Ans. Two trucks.

Cross 38. How many wheels in each truck of the Tyler car?

Ans. Eight in the two—four in each.

Cross 39. You are quite sure, are you, that the color of the car was red?

Ans. Well, I won't be sure. I think it was a kind of reddish color. It has been so long ago I can't remember.

Cross 40. Your recollection, then, is very indistinct, is it, in everything connected with the Tyler car, except the kind of brakes it had?

Ans. I know the brakes on it just as well as can be.

Cross 41. Then all else connected with the Tyler car is indistinct, is it, in your recollection, except the brakes?

Ans. Yes; near about. I know nearly how the car was built, and I think it had the rocking-chairs in it.

Cross 42. How was the Tyler car built?

Ans. It was built a good deal narrower than the cars are now. The platform was higher.

Cross 43. Did the Tyler car have a saloon inside of it as the cars do now running on that road?

Ans. Yes.

Cross 44. Was there a privy in the saloon?

Ans. Yes.

Cross 45. And this saloon was located inside of the door of the car, was it?

Ans. Yes.

Cross 46. You will please describe the construction of the brake on the Tyler car as you say you saw it the day the President was taken over the road in it.

Ans. It was the same as it always was.

Cross 47. How was it always? Please describe it.

Ans. It was a brake at each end. One man could brake it, but he would have to brake on each end. It would take two men to brake it at once.

Cross 48. Then you cannot describe the construction of the brake?

Ans. I can describe it enough to know near about how it was.

1074 Cross 49. What did you use on the platform to apply the brake?

Ans. A crank.

Cross 50. What was this crank connected to?

Ans. It was connected by a chain with the blocks.

Cross 51. In what way was it connected with the blocks by the chain?

Ans. By rods connected to the chain.

Cross 52. Do you know anything more about it than what you have stated?

Ans. No, I don't.

Re-examined:

53. Do you know how the single-acting brakes on the freight-cars now used on the Camden and Amboy Railroad are rigged?

Ans. No; I don't know exactly how they are fixed. I have nothing to do with them now. They are worked with a crank.

54. Is it a crank or a windlass?

Ans. One or two of them have cranks. Nearly the whole of them have wheels now.

55. How positive are you that the brakes on each end of the Tyler car operated on only one truck at a time?

Ans. I broke on it, and I know I couldn't stand on one end and brake both trucks; I am sure of that.

56. Was it any part of your business to know how the different parts of the brakes were connected?

Ans. It was my business to see that the brakes were all right. It wasn't my business to make them. It wasn't any part of my business to know how the parts of the brake were connected. All I know about that brake is, that one man couldn't stand at one end and brake it at both ends at one time—brake both trucks at the same time.

57. At the time the Tyler car carried the President, was there anything new about it; and, if so, what was new?

1075 Ans. There was nothing. I didn't take notice of anything new about it.

58. You have said the Tyler car was rebuilt; was it rebuilt before you left the road?

Ans. They said it was rebuilt after I left the road. That is all I know about it.

59. You said in your 17th cross-answer that you had to look at the brakes first at the time you saw the President at Bordentown. Why did you have to look at the brakes on the Tyler car at that time?

Ans. I hadn't to look at them, but I cast my eye on them at the time, and know both brakes were there at that time.

60. You say you had been brakeman on the Tyler car before it carried the President. Was the car known by any name before it carried the President?

Ans. No; it didn't go by any name before it carried the President.

61. What name did it go by after it carried the President?

Ans. We called it the Tyler car after he rode in it.

62. What part of the road did it run on before it carried the President in 1843?

Ans. Mostly from Bordentown to Trenton before it carried the President.

63. Was there any change made in the brakes of the Tyler car after the time when it carried the President before you left the road?

Ans. No; they never changed it before I left the road.

Recross:

Cross 64. Had the car been used for a time on the Camden and Amboy road between Bordentown and Trenton before it took the President over the road?

Ans. Used some; yes.

Cross 65. Then it was not a new car, or a car just fitted up, that took the President over the road?

1076 Ans. It wasn't brand new. It had been run some.

Cross 66. Do you know Edwin Lockwood, superintendent of the car department of the Camden and Amboy Railroad at that time and since?

Ans. Yes, sir.

Cross 67. Do you think he would know what kind of a brake was on the Tyler car when it took the President over the road?

(Objected to.)

Ans. I should think he would, for he made the brake and ought to know. If he didn't know no other man could.

Cross 68. When you received pay as brakeman on the Camden and Amboy road the year the President went over the road, did you sign a receipt for the money?

Ans. Capt. Shippen signed the roll that had our names on it.

Cross 69. Do you mean that M'r Lockwood made the brake on the Tyler car, or that he had charge of the making of it?

Ans. He had charge of the making of it, I suppose.

Re-examined:

70. If Edwin Lockwood should say that the Tyler car, when it carried the President, had on it brakes which would brake both trucks from one end of the car at the same time, would you think you were mistaken in what you have stated here to-day about those brakes?

Ans. No; I don't think I would be mistaken in what I have said.

71. Would you feel sure of the correctness of what you have said, no matter what Lockwood or any others might say about it?

Ans. I am near about sure that the car had a brake on each end. I am sure of that. I am sure.

1077 72. Would you be sure that the brakes on the Tyler car did not brake but one truck at a time from one end of the car, no matter what Lockwood or others might say about that?

Ans. I think I would be sure of it.

Recross:

73. Then you profess, do you, to know better what kind of brake was on the Tyler car, when it took the President over the road, than M'r Lockwood, or others under him?

(Objected to because the witness has not so stated.)

Ans. What I have stated I think is near about right; Lockwood may know more about how the brakes were made than I do.

Re-examined:

74. Would you know as much as Lockwood about whether the brakes on the Tyler car would brake on more than one truck from one end of the car at the same time?

Ans. I would know as much as he about that, because I have used the brakes; I don't think it could brake on both trucks at a time.

75. You say you "don't think;" do you feel sure about it?

Ans. I am sure they couldn't brake both trucks at the same time.

JAMES HERBERT.

Subscribed and sworn to before me this 17th day of October, 1868.

W. GRIER HIBLER,
U. S. Commissioner.

1078 NEW YORK, *Oct.* 26, 1868—10 a. m.

Present, M'r S. D. Cozzens, counsel for the complainant, and the complainant in person, and M'r S. M. Whipple, counsel for defendant.

JOSEPH CAPNER, a witness called on part of the complainant.

1. Q. Have you been examined as a witness in this case?

A. I have.

2. Q. Will you now state what was the first kind of double-acting brake—that is, acting on both trucks at the same time from either end of the car—which you saw or knew of being in use on the Camden and Amboy Railroad?

A. Double levers swung in links.

3. Q. Will you state whether there is anything now before you which represents this brake with double levers swung in links?

A. Something on the same principle. This on the model now before me is brass, and the other was iron; this is the only difference; I mean that this model does represent the brake, except that on the model the brake is brass, and on the car it was iron.

(Model annexed as an exhibit, marked "Hodge Model.")

4. Q. Will you state by what means the brake-power was applied at the ends of the car in this brake like the Hodge model?

A. By a crank; the model has wheels or windlasses.

And being cross-examined by M'r Whipple, counsel for defendant, he deposes and says as follows:

1079 1. Cross-q. What year did you first see a brake on a car of the Camden and Amboy road like the Hodge model?

A. In 1850, I think; in that neighborhood.

2. Cross-q. May it not have been in 1848 or 1849?

A. I could not say positively.

3. Cross-q. Before seeing a brake on a car of the Camden and Amboy road like the Hodge model, did you see on a car of that road a brake with a cross-lever under the body, by which the brakes were applied to both trucks from one truck or windlass?

A. Not until after this Hodge brake.

4. Cross-q. On reflection, do you think you were mistaken as to the time when you first saw the cross-lever connected double-brake, at the time when you testified before in this case?

A. As to that, the single or the double lever, the double lever was the first; but as to time, I cannot be positive.

And being re-examined by M'r Cozzens, he deposes and says:

1. Redirect q. What kind of brakes were used on the Camden and Amboy road before this double-lever or Hodge brake was used there, as you state?

A. The single brake on one truck.

And being further cross-examined by M'r Whipple, he deposes and says:

1. Recross-q. May there not have been a connected centre-lever brake in use on that road before you saw the Hodge-model brake, which escaped your observation?

A. I think not.

Q. Recross-q. Did you examine all the passenger, crate, and baggage cars of that road before you saw this Hodge-model brake for the purpose of ascertaining what brakes were in use on all the cars composing passenger trains?

1080 A. If there was anything new in the way of brakes I generally saw it. The train I ran had a great deal of braking to do, and it caused me to look out pretty well for the brakes. I cannot say that I particularly examined minutely, but if there was anything new I generally saw it. I did not make it a business to particularly inspect, but looked at the cars, and if there was any such thing under the cars I could see it.

3. Recross-q. Was your business such at the time you first saw the Hodge-model brake that you were brought in contact with all the cars that make up the passenger equipment of the Camden and Amboy road, and by that I mean the Philadelphia and Trenton line, the Bordentown and Trenton, the Camden and Amboy, and all their brakes respectively?

A. It was.

4. Recross-q. Did you, as brakeman, run upon all these lines?

A. No, sir.

JOSEPH CAPNER.

Subscribed and sworn to before me this 26th day of October, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination adjourned to Oct. 27th, 1868, at 9 a. m.

JOSEPH GUTMAN, J'R.

1081 GEORGE W. TEESE, a witness called on the part of the complainant.

Q. 1. What is your name age, residence and occupation?

A. My name is George W. Teese; I am 46 years of age; I reside in Jersey City; I am an engineer.

Q. 2. Were you ever employed on the Philadelphia and Trenton Railroad; if so, what did you do there?

A. Yes, sir; I served my time there as a machinist.

Q. 3. From the Philadelphia and Trenton Railroad did you go to any other railroad; if so, to what railroad?

A. I did, to the Camden and Amboy Railroad.

Q. 4. About how long did you remain on the Camden and Amboy Railroad, and what did you do there?

A. About five or six years; I was engineer.

Q. 5. Do you remember what year it was when you commenced on the Camden and Amboy road?

A. It was twenty-six years ago this month that I commenced running on the Philadelphia and Trenton road as an engineer. I ran on that road about two or three years, and then went on the Camden and Amboy road.

Q. 6. Did you do anything on the Camden and Amboy road except to run as engineer?

A. No, sir. I was transferred from the Philadelphia and Trenton road to the Camden and Amboy road.

Q. 7. After remaining the five or six years as engineer on the Camden and Amboy road, as you have stated, were you or not again employed on the Philadelphia and Trenton road as engineer?

A. Yes, sir; I came back and ran again.

Q. 8. About how long did you run again there?

A. I shifted back and forwards from one road to the other, so that I cannot exactly tell.

Q. 9. In about what year was it that you finally left the Camden and Amboy road?

A. In 1850 or 1851; I think in 1851.

Q. 10. While you were employed as you have above stated, did
1082 you know of a car on the Camden and Amboy road known as the
Tyler car?

A. Yes, sir.

Q. 11. For about how long did you know of that car?

A. I could not tell exactly, there was so much shifting of cars. She ran on the Philadelphia and Trenton road when I was running there.

Q. 12. And did you know of her after you went from the Philadelphia and Trenton road to the Camden and Amboy road?

A. Yes, sir.

Q. 13. Do you know what kind of brakes were on this Tyler car during the time you knew of her? And, if you do, state what kind.

A. I do; the double-lever brake, the same exactly as this Hodge model brake.

Q. 14. About when was it, as nearly as you can tell with reference to the time, when you left the Camden and Amboy road, that you first knew of this Tyler car having the Hodge brake?

A. It was about the time I left the road in 1851.

Q. 15. Do you know what kind of brakes were on this Tyler car before the Hodge brake was put on it, and, if so, what kind were they?

A. I think it had on a crank brake, without a ratchet.

Q. 16. How many trucks did these crank brakes on the Tyler car operate on at one time?

(Objected to by M'r Whipple.)

A. On one truck.

Q. 17. How many of these crank brakes operating on one truck at one time were there on this Tyler car before the Hodge brake was put on said car?

A. Two—one at each end.

Q. 18. Do you know a man on the Camden and Amboy road named William Quigley?

A. Yes, sir; he is an engineer now.

Q. 19. Do you know where said Quigley was employed after
1083 you went from the Philadelphia and Trenton road to the Camden
and Amboy road?

A. He was an extra brake-tender on the Camden and Amboy road; he was employed by the hands when they wanted him, sometimes as brakeman, sometimes as fireman. I do not know whether the company employed him at that time or not.

Q. 20. Do you remember some of the trains that Quigley ran on after you went from the Philadelphia and Trenton road to the Camden and Amboy road?

A. Yes, sir; he used to go as brake-tender for me from Trenton to Kensington on passenger trains. I cannot say what year it was. He ran extra on the Camden and Amboy road.

Q. 21. Do you remember a train being run over the Philadelphia and Trenton road to save the charter? and, if so, please state the circumstances.

A. I do; I ran the train, as engineer, to save the charter. The road had been in bad condition and had stopped running, and the State of Pennsylvania said they must run their trains.

Q. 22. State who was brakeman for you on this train that you ran to save the charter?

A. William Quigley.

And being cross-examined by M'r Whipple, he deposes and says as follows:

Cross-q. 1. Do you know what kind of a brake was in use on the Tyler car in the year 1843?

A. Yes, sir; it had on the single brake.

Cross-q. 2. How did you know it had on the single brake?

A. It had two cranks, one at each end, and required two men to put the brake on.

Cross-q. 3. Was this Tyler car a new or an old car in 1843?

A. We called her a new car.

1084 Cross-q. 4. Was it a new car in January or February, 1843?

A. I cannot say exactly as to that.

Cross-q. 5. What did you know about the car in 1843?

A. I saw her at Trenton in 1843. If I am not mistaken, she ran from Trenton to Jersey City in that year.

GEORGE W. TEESE.

Subscribed and sworn to before me this twenty-sixth day of October, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination adjourned to Oct. 27th, 1868, at 9 a. m.

JOSEPH GUTMAN, J'R,
Examiner, &c.

NEW YORK, *October 27th*, 1868.

Present, M'r Cozzens, counsel for the complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

THOMAS M. NORTH, a witness heretofore sworn and examined on the part of the complainant, recalled, and being further examined by M'r Cozzens, counsel for complainant, deposes and says as follows:

Q. 1. Will you look at the paper now shown you, which is the original of defendant's Exhibit K, put in evidence by them at the time of their examination of Joseph F. Talson, and state whether you ever saw that paper or one like it before?

A. In the summer of 1853, Joseph F. Talson showed me a paper containing drawings of trucks and brakes and certificates of their use. The paper was either the same now shown me or substantially like it. There is no year mark by which I can positively identify this
1085 paper as being the same then shown me, but it comes back to my memory as being either the same or substantially the same as the one then shown me. It certainly was this one or one containing substantially similar drawings and certificates.

Q. 2. In connection with what matter did Talson show you the paper in the summer of 1853?

A. In connection with the subject of my defense of the suit brought by Tanner against the Hudson River Railroad Company, as to which I have previously testified.

Q. 3. Was this paper shown you by Talson before or after the settlement of that suit, which settlement, as you testified before, you advised?

A. Before.

THOMAS M. NORTH.

Subscribed and sworn to before me this 1st day of Oct., 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Henry H. Disbrow, a witness of lawful age, produced on the part of the complainant, having been by me first duly cautioned and sworn to testify the truth, the whole truth, and nothing but the truth, in the matter of controversy herein, and being examined by M'r Cozzens, of counsel for complainant, deposes and says as follows:

(M'r Whipple objects to any further examination of this witness at this stage of the case.)

Q. 1. Have you before been examined in this case?

A. I have.

Q. 2. In your previous testimony you spoke of repairing a brake which operated on both trucks of the car at the same time. Will you look at the model now before you, marked "Hodge Model," and state what it represents?

A. This looks very much like the one I repaired. It runs in my mind there was another rod there, longitudinally in the centre of the car.

1086 Q. 3. State whether the brake which you think you repaired had cross-levers; and, if so, how many.

(Objected to.)

A. I could not exactly state.

And being cross-examined by M'r Whipple, he deposes and says:

Cross-q. 1. Was the brake which you repaired a single cross-lever brake?

A. It runs in my mind it was a double one.

Cross-q. 2. How many connecting rods?

A. It appears to me there were two.

Cross-q. 3. May it not have had four?

A. It might have had four, but I could not say.

HENRY H. DISBROW.

Subscribed and sworn to before me this 27th day of October, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Witness **George W. Teese** recalled for cross-examination, and his cross-examination being resumed by M'r Whipple, he deposes and says as follows:

Cross-q. 6. Have you had any conversation with M'r Sayles, complainant in this case, on the subject matter of your evidence since you were on the stand yesterday?

A. I have not, sir.

Cross-q. 7. Did not M'r Sayles, when you were out a few moments ago, call your attention to anything connected with your evidence given yesterday?

A. No, sir.

1087 Cross-q. 8. When was your attention first called to this matter of single and double brakes?

A. About four weeks ago.

Cross-q. 9. Who called on you?

A. M'r Sayles.

Cross-q. 10. What did he say that he wanted of you?

A. To ascertain about these brakes, the double-acting brake.

Cross-q. 11. What did he want to know about these brakes?

A. He asked me about a brake; if I ever saw such a brake on the road, such a one as the one in the model. I told him I had not until I was about leaving the road in about 1850 or 1851.

Cross-q. 12. Did you run the Tyler car in your train on the Philadelphia & Trenton road?

A. No, sir.

Cross-q. 13. Why was this car called the Tyler car?

A. Because it conveyed John Tyler over the road.

Cross-q. 14. When did it take the President over the road?

A. In 1841 or 1842, I think. I cannot say exactly.

Cross-q. 15. Did you see the Tyler car on the day it took the President over the road?

A. I did not.

Cross-q. 16. Do you know what kind of brakes the car had on at the time it took the President over the road?

A. I do not, of course, at that time.

Cross-q. 17. When did you first know from your own personal inspection of the car, the kind of brakes?

A. I think it was in 1845 or 1846.

Cross-q. 18. Are you positive as to time?

A. Of course.

Cross q. 19. Was this Tyler car originally built by the Camden and Amboy road?

A. I could not say. I do not think it was.

Cross-q. 20. What were some of the peculiarities of this Tyler car?

1088 A. She was a kind of a fancy car—a little more extra than any other car of the company on the road.

Cross q. 21. What kind of trucks had it?

A. She had what we called six-wheel trucks.

Cross-q. 22. What kind of springs?

A. I could not say exactly.

Cross-q. 23. Did it have a saloon and privy inside of the car?

A. No, sir; outside on the platform.

Cross-q. 24. What kind of seats had it?

A. I took no notice of the seats. I had nothing to do inside.

Cross-q. 25. Did this car run as a regular thing after it took the President over the road?

A. She run in a way train or passenger train as they thought fit, but I cannot say about it.

Cross-q. 26. What year did you run the train on the Philadelphia and Trenton road to save the charter?

A. I cannot exactly say.

Cross-q. 27. How many years before you left the road did you run this train?

A. I think it was in 1846 or 1847.

Cross-q. 28. Was this Tyler car rebuilt after it took the President over the road?

A. I cannot tell whether it was or not.

Cross-q. 29. Do you know Edwin Lockwood?

A. Yes, sir.

Cross-q. 30. Do you think he would be likely to know what kind of a brake was on the Tyler car when it took the President over the road?

A. I should think he would. He was boss of the shop, the car shop.

Cross-q. 31. You think, then, he ought to know what brake was on that car at that time?

A. Undoubtedly I should.

Cross-q. 32. The first double brake, then, which you have any recollection of seeing on the Camden and Amboy and Philadelphia and Trenton roads is the Hodge model brake, was it?

A. Yes; the brake similar to this Hodge model.

1089 And being re-examined by M'r Cozzens, of counsel for complainant, he deposes and says:

Redirect q. 1. What road were you on at the time the President went over the Camden and Amboy road?

A. On the Philadelphia and Trenton road.

Redirect q. 2. You said something about how well you remembered the Tyler car; please state how well you do remember it?

A. She was a fancy car. I remember the car well.

Redirect q. 3. May the running of the train to save the charter have been earlier than 1846 or 1847?

A. I cannot exactly say; it may be.

And being further cross-examined by M'r Whipple, he deposes and says:

Recross-q. 1. Then the substance of your evidence in this case is that you have no recollection of seeing a double-acting brake on the Camden and Amboy or Philadelphia and Trenton roads until you saw the Hodge model brake?

(Objected to.)

A. Yes, sir.

And being further re-examined by M'r Cozzens, he deposes and says:

Redirect q. 4. Do you mean by this answer to change in any way what you have above testified respecting the Tyler car?

(Objected to.)

A. No, sir.

1090 And being further cross-examined by M'r Whipple, he deposes and says:

Recross-q. 2. What more have you to say in regard to the Tyler car?

A. I have said enough now. What I have to say is that the Hodge model brake was on the Tyler car, and is the first double-acting brake that I saw on the road.

And being further re-examined by M'r Cozzens, he deposes and says:

Redirect q. 5. Before this Hodge brake was on the Tyler car what kind of brakes were on the Tyler car?

A. The single brake, that braked on one end, and required two brakemen to put the brakes on.

And being further cross-examined by M'r Whipple, he deposes and says:

Recross-q. 3. Is not there a possibility that you may be mistaken as to the kind of brakes on the Tyler car from the time it took the President on the road to the time you say you saw a Hodge brake on said Tyler car?

A. No mistake at all about it.

Recross-q. 4. Then you know, do you, what kind of brake was on the Tyler car at the time it took the President over the road?

A. The brake was on the Tyler car the same as it would be on the rest of the cars.

Recross-q. 5. You know this, do you?

A. I could not say exactly.

And being further re-examined by M'r Cozzens, he deposes and says:

Redirect q. 6. What is it that you mean you could not say exactly about?

1091 A. I say the brakes on the Tyler car were like the brakes on the other cars, single brakes.

And being further cross-examined by M'r Whipple, he deposes and says:

Recross-q. 6. You know this, do you?

A. Of course I do.

Recross-q. 7. There is no doubt at all in your mind?

A. I have told you so.

Subscribed and sworn to.

GEORGE W. TEESE.

NEW YORK, 34 *Beach Street*, *N. Y.*,
October 28th, 1868—a. m.

Present, M'r Cozzens, of counsel for the complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

George Gifford recalled as a witness on the part of the complainant.

Q. 1. Please look at the paper now shown you and state what it is, in whose handwriting the body of it is, and whose the signature to it is, and when, as nearly as you can state, it was written.

A. It is a letter which was dictated by me to M. B. Andruss, who wrote it as I dictated it, and who was then a clerk of mine. It was signed by me, and written about the time it bears date, and I have no doubt on the same day. It was written to M'r North, who was then secretary and attorney of the Hudson River Railroad Company. It was written while a suit was pending on the Tanner brake patent against the Hudson River Railroad Company.

Q. 2. M'r North was the same person to which you referred in your previous examination in this case?

1092 A. He was.

Q. 3. State whether that letter was written before or after your interviews with Joseph F. Talson in relation to the defense in the said suit?

A. It was written after those interviews, and after a very careful consideration of all the information I could get from M'r Talson respecting any use of a brake which would be serviceable as a defense in that suit.

Q. 4. Will you annex that letter to this deposition?

A. I have no objection to so doing.

(Letter annexed marked "Gifford's Exhibit, J. G., J'r.")

Subscribed and sworn to before me this 28th day of October, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Gifford's Exhibit.—J. G., J'r.

NEW YORK, *October 11th*, 1853.

M'r NORTH:

DEAR SIR: Have you heard from M'r Grovner? I find on examination of the case, 1st, that Thompson & Bachelder invented the brake as early as 1846 or 1847 (see testimony taken), and that the one shown in their drawings filed in 1847 is not essentially changed from the one shown in the drawings of the patent; 2d, that none of our patents which we have as evidence go back further than 1848; 3rd, that the Talson brake of 1842 was barely tried and laid aside, and amounts to such an experiment as the courts have often held to be insufficient to defeat a patent. Now, unless we receive aid from the eastern testimony of a prior use, the chances, in my opinion, will be greatly against us.

1093 If we expect to avail ourselves of that testimony, not a day should be lost in dispatching some smart, intelligent man to see those witnesses and bring them here, and thence to Albany.

Is it not possible that the plaintiff's attorney may not be anxious to try the cause this term, and would it not be well for you to telegraph him asking whether he expects to try?

I perhaps betray some anxiety about the case, for I realize that we are not and fear we shall not be ready, and I do hate a defeat.

Yours, truly,

GEO. GIFFORD.

OCTOBER 29TH, 1868—11 a. m.

Present, counsel as before and the complainant in person.

ISAAC P. WENDELL produced on the part of the complainant.

Q. 1. What is your name, age, residence, and occupation?

A. My name is Isaac P. Wendell. I am 56 years of age. I reside in Philadelphia. I am in the railroad-supply business.

Q. 2. Are you acquainted with Thomas Sayles, the complainant in this case; if so, for about how long have you known him?

A. I am; I have known him between three and four years.

Q. 3. Do you know, or did you ever see, a man by the name of J. E. Cudlipp?

A. I knew a M'r Cudlipp; I do not know his initials.

Q. 4. Were you ever present at a conversation between said Cudlipp and said Sayles? If so, where was said conversation?

1094 A. I' was at the Girard House, at the corner of West Broadway and Chambers street, New York City.

Q. 5. When, or what month and year did this conversation take place, as near as you can recollect?

A. I think it was in August, 1867.

Q. 6. Will you state as nearly as you can what the conversation was?

A. I can give the substance, but not the particular words. M'r Sayles requested me to be present. He told M'r Cudlipp that he wanted a good, smart railroad man to help get at the facts in this case of his; that, as he was opposing railroad companies, the railroad employees would be afraid to speak as freely to him as they would to him (Cudlipp), or a man like him, who had been employed on railroads. He asked M'r Cudlipp in regard to his knowledge of the double brake. I think he put it in this way, "You did not know of any double brake in use before the one put on by M'r Baker?" I think M'r Cudlipp stated that there was one (M'r Whipple here objects to any evidence of further conversation between these parties) that had been a failure, and lay in the shop at the time he went there. That seems to be the substance of the conversation as far as I can call it to mind at present.

Q. 7. In that conversation, did M'r Sayles say anything to Cudlipp about having any money to spend in the case?

A. I do not recollect that he did.

Q. 8. Did he tell Cudlipp that he had some $50,000 to spend in this case, and was not going to be mean about it; or anything to that effect?

A. Not that I recollect.

Q. 9. Could any such remark as that have been made by M'r Sayles without your hearing it?

A. I think not.

Q. 10. Did M'r Sayles say that he understood that Cudlipp was the only man that could influence Talson?

A. No, sir, not to my recollection.

Examination adjourned to same day at 3 p. m.

1095 OCTOBER 29TH, 1868—3 p. m.

Present, complainant in person and counsel as before.

Q. 11. In that conversation at the Girard House, did M'r Sayles say anything to Cudlipp about going before a lawyer and securing to Cudlipp any part of the income from the patent? If so, what did he say?

A. He did not.

Q. 12. Did Cudlipp in that conversation say anything to M'r Sayles in your presence about having heard about the old Stanley brake when he first went on the New Jersey road; and, if so, what did he say?

A. He said that he had heard of it, and that it had been a failure; that it lay somewhere about the shop when he went there.

Q. 13. Did he in that conversation say anything to M'r Sayles about knowing that there was no double brake on the New Jersey road before Baker put the double brake on? If so, what did he say? Answer fully.

A. He said that there was no double brake on, to his knowledge, before Baker put one on in 1850 or 1851.

Q. 14. In that conversation, did M'r Sayles say anything to Cudlipp about wanting him (Cudlipp) to look up the facts in regard to the use of double brakes; and, if so, what did he say?

A. He said he wanted a good, smart man like him, who had been an employee upon railroads, to look up the facts in the case.

Q. 15. In that conversation, did Sayles show Cudlipp any testimony, or what purported to be testimony; and, if he did, what testimony was it; and what, if anything, did he say to Cudlipp in connection with it?

A. He showed him some written testimony of the Albany case where M'r Talson had testified, and said that if M'r Talson would testify to that, it was the facts in the case.

Q. 16. Did he say anything to Cudlipp about wishing any testimony or any facts to be kept back by Talson or any other person?

A. No, sir.

1096 Q. 17. In regard to Sayles telling Cudlipp that he wished some smart railroad man like him to look up the facts, I will inquire what facts; that is, facts as to what matters Sayles wanted a man to look up?

A. In regard to the brake case; I understood that it was the general facts as to the brake being in use.

Q. 18. The brake being in use where?

A. On any roads. My idea was that he wanted some good man to look up the facts. In relation to the time this Tanner brake had been used on the New Jersey Transportation road and on the Camden & Amboy, Sayles said he wanted a good, smart man to look up the facts in this case. These were the words.

Q. 19. Was anything said in that conversation by M'r Sayles about Cudlipp's influencing Talson?

A. No, sir.

Q. 20. In that conversation, did Cudlipp say anything to Sayles about whether if there had been double brakes on the Camden & Amboy cars which came to Jersey City he would have seen them? If so, what did he say?

A. I do not remember.

Q. 21. After that conversation at the Girard House was concluded, where did Sayles and Cudlipp go, if you know?

A. They went up to the corner of Broadway and Vesey street. I went with them.

Q. 22. Cudlipp has said that he thinks that it is his impression that the person who was present at that conversation went down Chambers street to the ferry. Did you go down Chambers street to the ferry?

A. No, sir.

Q. 23. In accompanying them to the corner of Vesey street, where did you walk, and how near to them did you walk?

A. I walked alongside.

Cross-examined by M'r Whipple:

Cross-q. 1. You say you are engaged in the railroad-supply business. What kind of supply business?

1097 A. Journal boxes and bearings, and lubricators particularly.

Cross q. 2. What is the name of your firm, furnishing these supplies, and where is it located in Philadelphia?

A. It is in my own name; at 332 Walnut street, Philadelphia. The sign is I. P. Wendell & Co.; but there is no Co.

Cross-q. 3. Do you manufacture the articles in which you deal, to wit, oil and journal-boxes?

A. I do not. I contract for them.

Cross-q. 4. Is the article you deal in secured by patent?

A. It is, partly.

Cross q. 5. Is M'r Sayles an interested party?

A. No, sir.

Cross-q. 6. Have you any business connection with him?

A. No, sir.

Cross-q. 7. When did you first make his acquaintance?

A. Between three and four years ago.

Cross-q. 8. What business relations have called you and M'r Sayles together for the last year frequently?

A. I have sold M'r Sayles a part interest in a patent that I owned.

Cross-q. 9. Is there anything due from M'r Sayles to you for it?

A. No, sir.

Cross-q. 10. What circumstance called you and M'r Sayles and Cudlipp together at the Girard House?

A. We were both boarding there.

Cross-q. 11. How happened you to be privy to the conversation between Cudlipp and M'r Sayles?

A. M'r Sayles requested me.

Cross-q. 12. Why did M'r Sayles want you to be present?

A. I do not know.

Cross-q. 13. What inducement, if any, did Sayles offer Cudlipp to secure his services in looking up testimony in this case?

A. None in my presence.

1098 Cross-q. 14. Then he wished to secure his services without naming any remuneration, did he?

A. I do not know.

Cross-q. 15. What did you understand that Sayles wanted Cudlipp to see Talson for?

A. To see if his testimony would be the same as in the Albany case.

Cross-q. 16. You say Sayles and Cudlipp went to the corner of Broadway and Vesey street, and you went with them. What did they go there for?

A. I understood M'r Cudlipp was to go to see Talson at some office near there.

Cross-q. 17. Did he see him?

A. I do not know.

Cross-q. 18. Were you present at more than one interview between Sayles and Cudlipp?

A. No, sir.

Cross q. 19. Did Cudlipp give Sayles encouragement of entering into his service? - -

A. I think he did; he so impressed me.

Cross-q. 20. But no consideration was offered for such service, or none talked of?

A. Not in my presence.

Cross-q. 21. Had not all this matter of consideration been talked over at a meeting prior to this, at which you had been present?

A. I was never present at any other.

Cross-q. 22. Did you learn from M'r Sayles that he had had interviews with Cudlipp prior to this meeting, at which you say you were present?

A. Yes, sir.

Cross-q. 23. What did M'r Sayles tell you about the conversations or meetings had with M'r Cudlipp?

A. He said he thought he had found a first rate witness in M'r Cudlipp.

Cross-q. 24. Witness about what?

A. This brake case.

Cross-q. 25. Then he wanted M'r Cudlipp as a witness, did he not?

1099 A. I do not know.

Cross-q. 26. Did not M'r Sayles say that he intended to call him as a witness in this case?

A. No, sir.

Cross-q. 27. Did you infer that he intended to call him?

A. Yes.

Cross-q. 28. Did M'r Sayles ever say to you why he did not call him?

A. No, sir.

ISAAC P. WENDELL.

Subscribed and sworn to before me this 29th day of October, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Examination further adjourned to Nov. 4th, 1868, at 10 a. m.

NOVEMBER 4TH, 1868—10 a. m.

Examination further adjourned to Nov. 7, 1868, at 9 a. m.

JOSEPH GUTMAN, J'R,
Examiner, &c.

NEW YORK, *November 7th*, 1868—9 a. m.

Present, M'r Sayles, complainant, and M'r Whipple, counsel for defendant, and M'r Cozzens, counsel for complainant.

RICHARD C. WALCOTT, produced by complainant as a witness:

Q. 1. Have you before been examined as a witness in this case?

A. Yes; I have been examined by the defendant.

1100 Q. 2. In your former testimony in this case (M'r Whipple objects to any further examination of the witness), you spoke of a crate-car, running between Philadelphia and Trenton, which you thought had upon it a double-acting brake. Are you able to state positively how many cross levers, under the body of the car, that double brake had?

A. No, sir.

Q. 3. You spoke also of taking the place of an engineer who was killed, on the 25th of February, 1848. Are you able to state how long it was after you took the place of that engineer that you first saw the double break you referred to in your said previous testimony?

A. I could not say positively how long it was after.

Q. 4. Are you able to state whether it was one year, eighteen months, or two years after you took the place of that engineer?

A. I think it was somewhere along a year. It might have been a little over a year, and it might have been a little under a year. It might have been a year or eighteen months. I never set any of these things down.

Q. 5. Will you state whether it was while M'r Van Rensselaer was assistant superintendent?

A. Yes, sir; I think it was about the time of his first coming on that I saw it. I cannot swear to it, any how. It just appears like a dream to me; that is, I mean the date.

Q. 6. Will you please look at the model, now shown you, which is marked "Hodge Model," and state whether you can now say whether this model is, or is not, a representation of the double brake you referred to in your said previous testimony?

(Objected to, as the witness has already identified the model A as being the one.)

A. I can't say whether this model represents it or not.

Cross-examined by M'r Whipple:

1101 Cross-q. 1. Do you fix the time of seeing this double brake soon after the death of Joseph Cox, or about the time M'r Van Rensselaer came on the road as assistant superintendent?

A. It was somewheres within a year, or somewhere of that time; I can't fix the date; it bothers me to remember the time.

RICHARD C. WOLCOTT.

DAVID H. BAKER, being recalled on the part of the complainant, testifies as follows:

Q. 1. Please state whether since this suit has been pending you have had any interview with M'r J. E. Cudlipp, and, if so, where was it, and about how long ago was it?

A. I have had an interview with him twice, one at his house and one at my house; the one at my house was on Sunday.

Q. 2. In the interview at your house did you say anything to Cudlipp about there being money in this case, or in the double-acting brake patent; and if you did, what did you say?

A. I don't think the brake case was approached at all in the last interview—not to my knowledge.

Q. 3. Did you say anything about it at the other interview; and if so, what did you say?

A. I can't tell the exact words. I told him that there was considerable money in the concern; I may have said that in the course of the conversation. There was very little said, anyway.

Q. 4. What did you mean by that remark, that there was "money in the concern?"

A. I meant that if the patent was sustained, the R. R. Co. would have to pay a great deal of money, or else they would get clear of paying a great deal; the same as I would talk of any man doing business.

Q. 5. Did you say anything to Cudlipp at any time about there being "some money in it for both of us?"

A. I did not.

1102 Q. 6. Did you say anything to Cudlipp at any time about his "using his influence" with Joseph F. Talson for any purpose?

A. I did not.

Q. 7. Did you say anything at any time to Cudlipp about "managing Talson," or that "if he (Cudlipp) could manage M'r Talson, we could probably make some little out of it," or anything to any such effect?

A. The words "we," or "managing," were not brought into the conversation, nor nothing to that effect. I did not say as inquired of in the qu'stion.

Q. 8. In either of those interviews did Cudlipp say anything to you about what was the first double-acting brake he knew of on the New Jersey road; and if so, what did he say?

A. I never heard of any other kind of a double-acting brake from him as being used on the road, except the one I put on and the trial of what was called the Stanley brake.

Q. 9. At any other times than these interviews since this suit has been pending has said Cudlipp stated anything to you about what he knew respecting the use of a double-acting brake on the New Jersey Railroad; and if so, what has he said?

A. Not recently, but I have heard him make this expression, that there was no other brake on the road to his knowledge, other than above specified, viz, the Stanley experiment and the one I put on.

Q. 10. Has he told you that more than once?

A. I cannot say positively, but I think he has. I think he told me so at the interview at his house.

Q. 11. Are you sure that he has told you so at least once?

A. Yes.

D. H. BAKER.

HENRY WATERMAN recalled as a witness on the part of the complainant.

1103 Q. 1. In your former testimony in this case you stated the circumstances of an interview you had with Edwin Lockwood at Bordentown, New Jersey, in 1859—did you know Edwin Lockwood by sight before going to Bordentown to see him on the occasion referred to?

A. I met M'r Lockwood in an interference case in the year 1854, but retained scarcely any recollection of him until the interview spoken of, when I was introduced to him by M'r Dougherty, master mechanic at the time. I had no introduction to M'r Lockwood at my first meeting with him in 1854.

Q. 2. How long had you known M'r Dougherty at the time of your interview with M'r Lockwood, referred to in your previous testimony in this case?

A. I think about six years at that time—when he was foreman for M'r Dunham—I refer to the M'r Dougherty whose first name is, I think, Samuel. He was familiarly called Sam Dougherty.

Q. 3. How intimate had you been with M'r Dougherty during this time?

A. Quite intimate; there was a free, familiar understanding between us.

Q. 4. Did you upon going to Bordentown to see Lockwood at the time you have referred to in 1859, request M'r Dougherty to introduce you to him?

A. I think I did, but I have no positive recollection of how it came about.

Q. 5. How came you to see M'r Dougherty at all when you so went to Bordentown?

A. I went into the locomotive shop at first, and I at once met M'r Dougherty, whom I recognized as my old acquaintance when he was foreman for M'r Dunham, at Thirty-third street in this city.

Q. 6. Were you looking for him when you went into the locomotive shop?

A. I knew that he was employed there and I naturally looked for him at once for the reason that I was most familiar with M'r Dougherty, and I knew he could direct me to the parties that could give me the information that I wanted.

1104 Q. 7. To whom did he take you?

A. To M'r Lockwood.

Q. 8. Is there any doubt in your mind that you saw Lockwood at Bordentown at that time?

A. I have not the least doubt; the circumstances are fresh in my memory.

Q. 9. Did you go to Bordentown more than once to see Lockwood upon the subject spoken of by you in your former testimony?

A. I did.

Q. 10. How many times?

A. Certainly twice, and I think three times.

Q. 11. It has been testified in this case that at the time you went to Bordentown to see Lockwood, as stated in your previous testimony, he (Lockwood) was absent from Bordentown. Is this true?

A. At my first visit to Bordentown I met M'r Lockwood, and this introduction that I have spoken of took place; it is not true that he was absent at the time above asked about.

Q. 12. Do you know a man by the name of Isaac Dripps?

A. I do.

Q. 13. Did you ever, at any time, call upon him at Fort Wayne, Indiana, in reference to the subject of double brakes?

A. I never did; I never was in the town of Fort Wayne.

Q. 14. How long have you known the said Dripps?

A. I have known him since 1847, I think, when he was master mechanic of the Camden and Amboy road. I never was familiar with M'r Dripps, but I was in the habit of stopping at Bordentown and talking of railroad machinery generally, with him.

Q. 15. Did you at any time see M'r Dripps at Trenton, New Jersey; and if so, about what year was it?

A. I did see M'r Dripps at Trenton; I think it was in 1859.

1105 Q. 16. Had that call anything to do with the subject upon which you saw Lockwood, in 1859; and if so, was your call on Dripps before you saw Lockwood or after?

A. I have had two matters of inquiry with M'r Dripps at Trenton—one in which I was defending the railroad companies against the Mathews spark-arrester patent, the other was the Hodge car-brake patent; my memory is not clear now as to dates, and I cannot state positively—the two matters lapped onto each other, but to the best of my recollection and belief I saw him before I saw Lockwood upon this very subject of the interview with Lockwood.

Q. 17. Do you remember at this time, when you so called on Dripps with reference to the subject of the Hodge brake on which you saw Lockwood, where you found Dripps?

A. I do; I found him at his dwelling.

Q. 18. Do you remember what condition of health he was in when you so found him?

A. He was complaining that he was not able to leave his room.

Q. 19. Will you state what was the conversation, or the substance of the conversation between you and him at this time on the subject of the Hodge brake, or on the subject of double-acting brakes?

A. I was endeavoring to get at the history of double-acting brakes on the Camden and Amboy Railroad; he stated that he did not recollect distinctly much about it, or words to that effect; that it was not in his line much; that M'r Lockwood could tell me all about it.

Q. 20. Did he, in that conversation, say anything to you about when he thought double-acting brakes were first used on the Camden and Amboy Railroad; if so, what did he say?

A. I do not recollect that he told me anything.

Q. 21. State how familiar you are with the construction and operation of the single brake and the various forms of double-acting brakes.

A. I consider myself quite familiar with all the forms of brakes above named.

1106 Q. 22. Will you also state what has been your experience as a practical railroad man.

A. Thirty years ago, in the year 1838, I had charge of the machinery of a railway, and was familiar then with all the forms of railway machinery known, and have kept myself posted in all the various machinery as it has been introduced, and I have constructed locomotive engines, railway cars, a dummy engine, and other railway machinery.

Q. 23. Have you ever been master mechanic of the Hudson River Railroad?

A. I have.

Q. 24. Will you please state what is the effect as to the flying back of the crank or windlass wheel in the case of the single-acting brake, acting upon only four wheels, when the brake had been put on and then is let go of, provided there is no pawl and ratchet to hold the brake staff?

A. It will instantly fly back and loosen itself if the parts are free to work.

Q. 25. Will you state what causes this flying back under such circumstances.

A. It is due to the strain and elasticity of the parts, like the bow unbending itself.

Q. 26. State what effect, if any, the springs on the brake bars have upon this flying back.

A. They add to and increase the flying back of the parts.

Q. 27. State whether or not the force with which this flying back often takes place in the single-acting brake is or is not considerable.

A. It is considerable and governed by the force with which the brake is wound up, and the strength of the springs that press back the brake bars.

Q. 28. In respect to this matter of flying back, is there any difference, or any essential difference, in the flying back produced when the brake or windlass staff is not held by anything after the brake has been wound up so as to be applied to the wheels, between the single-acting
1107 brake and the different forms of double-acting brakes known respectively as the Tanner or single centre-lever brake, the Hodge brake, or the Stevens brake ?

A. There is no essential difference. The action varies in degree with the number and elasticity of the parts involved.

Q. 29. Is it ever the case with the single brake that the piece of chain ordinarily used to form a flexible connection between the lower end of the windlass-staff and the rod which runs to the brake lever in the truck sometimes gets kinked or caught around the windlass-staff, so as of itself to hold the brake from letting itself off after it has been applied, and the crank or brake wheel from flying back, assuming as before that the brake staff is not held by any other means after the brake has been so applied ?

A. It is sometimes the case that the chain becomes jammed or caught, for the reason that from the gravity of the chain, if left to itself, it winds itself spirally around the brake staff in a downward direction, and when the length of the slack of the chain and of the parts allows the brake to tighten itself when the spiral coil of the chain is near the bottom of the barrel, the chain jams itself between the last preceding coil and the bottom support of the barrel, and jams itself quite tight.

Q. 30. Does it also sometimes happen with the single-acting brake that, after such a jamming of the chain has taken place so as of itself to hold the brake staff when the brake has been applied as you have stated, that, from some jar or other cause, the chain will free itself again and at once let the brakes off the wheels, and permit the crank or brake wheel to fly back, assuming, as before, that the brake staff has not been held by any other means than the jamming of the chain ?

A. In answer to this question I will state that when the jamming condition that I have above described has taken place, by the jar of the parts if the cars are in motion, it would be sure to loosen itself sooner or later, and allow it to fly back.

1108 Q. 31. Will this also sometimes happen if the jamming is not too tight, even though the car may not actually be in motion ?

A. There may be conditions in which the loosening of the bumpers, by taking off the brakes at any part of the train, or by reversing the locomotive, or by the sudden starting or twitching upon the draw bars, the disturbed relation between the car and the trucks, especially when the brakes are put on, that may by a sudden strain of the parts loosen itself.

Q. 32. Can you give any sort of idea about how many times, say in the course of a year, such a jamming of the chain might occur with the single brake ?

A. It is difficult to answer with any precision.

Q. 33. Is it a thing which may happen often or not ?

A. When the adjustments of the parts are as above by me described, it may occur often, or I should say I would expect it to occur often.

Q. 34. Will you please state whether, from whatever cause you say that the jamming and loosening again, which has been spoken of, may occur, is it or not the fact that it does occur, or is liable to occur frequently upon cars fitted with the single-acting brake ?

A. It will occur and is likely to occur in all cases.

Q. 35. May this same jamming and loosening again of the chain also occur frequently with the Tanner, Hodge, and Stevens double-acting brakes and from the same causes ?

A. It may occur with all the brakes mentioned, and from the same causes.

Q. 36. Will you state, as a practical railroad man, familiar with the different forms of brakes, both single-acting and double-acting, whether from the mere fact that a brake had been wound up so as to apply the brake shoes to the wheels, the brake staff not being provided with any means of holding it, and the brake crank or windlass had at first remained stationary after the brake shoes had been so applied, and had then suddenly flown back, even through with considerable force, a person could tell whether the brake was a single-acting brake or a double-acting brake ?

1109 A. It could not be told with precision under such circumstances whether the brake was a single-acting or a double-acting brake.

Cross-examined by M'r Whipple :

Cross-q. 1. Would you consider a brake in order, in which the chain would jam in applying the brakes to the wheels to check the train ?

A. I should not think it in order. I would have it corrected.

Re examined by M'r Cozzens :

Redirect q. 1. As a matter of fact are not cars the brakes of which are liable to have the chain jam as stated often run in railroad trains ?

A. They are, for the reason that the brake-shoes are constantly wearing, increasing the slack of the chain until it may arrive at the jamming condition without previous notice.

Cross-examined by M'r Whipple :

Recross-q. 2. Would it not be the duty of the brakeman to report the brakes in the condition you have described as being out of order, and would a car be allowed to run until so adjusted as to allow the brakes to work freely ?

A. It would be the duty of the brakeman to report the brake in such condition ; it is difficult to answer the last part of the question. Well, managed railroads are in the habit of repairing and adjusting all such delinquencies as soon as circumstances will allow.

Re-examined by M'r Cozzens :

Redirect q. 2. State whether or not a greater or less degree of 1110 jamming of the kind stated might not often occur upon cars considered in sufficiently good order to be run in a train ?

A. It might.

Recross-examined by M'r Whipple :

Recross-q. 3. And yet such brake would be out of order, would it not, in your opinion ?

A. It would be out of order.

Re-examined by M'r Cozzens :

Redirect q. 3. Would it be so much out of order that, notwithstanding, it might not be run in trains ?

A. It might not be so much out of order that it might not be run in trains successfully.

Cross-examined by M'r Whipple:

Recross-q. 4. Would it be a successful brake in which the chain would jam in applying the brakes to the wheels?

A. It would be a successful brake, but it would only require the loosening action of the brakeman.

HENRY WATERMAN.

THOMAS SAYLES, complainant, recalled.

Q. 1. J. E. Cudlipp, a witness in this case on the part of the defense, testified to interviews had between you and him on the subject of brakes. Will you state what, if anything, was said between you at any of those interviews about what Cudlipp in his testimony has called the Bachelder & Thompson brake?

1111 A. I do not remember of anything being said between us about the Bachelder & Thompson brake. The Tanner brake was spoken of, but I do not remember of Bachelder & Thompson's name being mentioned at all.

Q. 2. In those interviews, what, if anything, did you say to Cudlipp you wished him to do on your behalf in reference to this case?

A. I said to him that I would like to have him look up testimony for me in a suit I had with the Chicago & Northwestern R. R. Co.; that I had understood that he had been on the New Jersey R. R. a long time, and of course must be acquainted with a great many of the men that had been on that road, and the Camden and Amboy road, from 1843 to 1850, or thereabouts. I told him that I had the most of R. R. Co.'s in the United States combined against me in this suit, and I was obliged to go to men employed by railroads to prove the facts in regard to my brake matter, and these railroad men that he was acquainted with would be more likely to talk freely with him, and tell him what they knew about it, than they would with me. I told him I wanted somebody to look up evidence, that was smart, and was acquainted with the men on the Camden and Amboy and the New Jersey roads. I told him that Joseph F. Talson testified in 1854, in a case of the New York and Erie R. R., about these double-brakes, and that I supposed what he testified to at that time was true. I showed and read to him Talson's evidence in that Erie case, and I wished him to look up evidence for me to show the facts as to the use of double-brakes on the New Jersey road and on the Camden and Amboy road.

Q. 3. Did you say anything to him, at any of these interviews, about having $50,000 to spend in this case and were not going to be mean about it?

A. I did not.

Q. 4. At either of these interviews, did you say anything to him about his being the only man who could influence M'r Joseph F. Talson?

A. I did not.

Q. 5. In either of these interviews, did you say anything to him about wishing him to see Talson, and if so, what did you say?

1112 A. There was considerable said about Talson's testimony in the Erie case, and his looking up testimony against me in this present case, and I recollect that Cudlipp asked me if I knew what testimony Talson had got against me, and I told him I did not any further than testimony that had been put in the case, and I know he said that if he could see Talson he could find out what testimony he had in the case, as he said Talson was a brother-in-law of his and would tell him all about it. And whether I asked him to see Talson, or whether he first proposed to see him himself and ascertain what he could from him, I am unable to say.

Q. 6. Is that all or the substance of all that was said between you at those interviews about his seeing Talson?

A. He did call on me at the Girard House, in the latter part of August, 1867, and had a conversation with me there and spoke of calling on Talson the next Sunday, and then asked me if I knew where Talson's office was or his place of business. I told him I did, and he said he would go and see him then if he was at his office, and he did go. I went with him as far as the corner of Vesey street and the Astor House, and showed him where Talson's office was. I saw him after he called to see Talson. He said Talson was not in town. I think he said he was in Baltimore. He then said he would go and see Talson on the Sunday following. That, I think, is the substance of the talk I had with him about seeing Talson until after he had seen Talson.

Q. 7. What conversation did you have with him after he had seen Talson?

A. I saw him a few days after. He said he had seen Talson. He
told me that Talson told him that he had found testimony that was
sure to defeat my patent; that he had found testimony to show that
the centre-lever double-acting brake had been used on the Long Island
road a long time before my brake was invented. I think he said before
the Tanner brake was invented. He said Talson told him that they had
already taken testimony enough to defeat the patent. He also
1113 said that Talson said that he wouldn't give anything for the Tanner patent, and he (Cudlipp) said he would rather not have any-
thing to do with it; that is, looking up testimony in the case.

Q. 8. In any of these interviews did you say anything to Cudlipp about wishing him to influence Talson so far as to hold back what evidence he (Talson) had collected for the railroad companies, and to go no further with his (Talson's) own evidence than to answer questions as they were put to him?

A. I did not. I never heard anything about that until I heard Cudlipp testify to it in this case.

Q. 9. What, if anything, did you say to Cudlipp at any of these interviews about giving him 10 per cent. of the income of the brake or patent?

A. At one of the interviews that I had with him I told him that if he would take hold of the matter and help me look up the evidence, that if I succeeded in the suit, I would give him 10 per cent. of the net proceeds for his services.

Q. 10. Please state, specifically, what you meant and said to him this 10 per cent was to pay for.

A. I told him if he would go to work and assist me in looking up evidence to prove the facts in the case, as had been testified to by Talson in a previous case, which I supposed was true, and I told him that I supposed it was a big job, for we would have to go all over the country to look up men that had been on the Camden and Amboy Road, and on the New Jersey Road, between 1843 and 1850, for we had to get those facts from men who had been on those roads and knew about the brakes that had been used on those roads between 1843 and 1851. I told him they had proved on the other side that a brake like the Tanner brake had been put on a car on the Camden and Amboy Road in 1853, by a number of witnesses. I told him I thought these witnesses were mistaken about the time the brake was put on a Camden and Amboy car, and it was for looking up the witnesses to prove the facts in this case that I proposed to give him the 10 per cent. for, if I succeeded in the case.

1114 Q. 11. Did you in any of those interviews say a word to Cudlipp, or intimate to him, that you wished any part of this 10 per cent., or any money whatever to be used to influence Talson, or induce him (Talson) to hold back anything?

A. No; nothing of the kind.

Q. 12. In any of these interviews did you say anything to Cudlipp about his being at liberty to divide this 10 per cent. with anybody?

A. I did not.

Q. 13. You have referred to the interview at the Girard House. Please state what the conversation between you and Cudlipp at that interview was.

A. The conversation between us there was about the testimony that Talson gave in the Erie case, and about Cudlipp looking up testimony for me of the same nature that Talson testified in the Erie case, and to show that the double-acting brake was not used on the Camden & Amboy Road before 1850 or 1851; that was the substance of our conversation there.

Q. 14. Then it did not differ essentially, did it, from the conversation you had with him at the interviews previous to that?

A. I don't remember that they differed very materially. I now recollect that at the Girard House interview, and also at the first interview I had with him, he said that when he first went on the New Jersey Road he saw a brake that he was told had been tried on a car by one Stanley some time before he went there, and had failed and was taken off the car and lay somewhere in the shop over head. He had seen that brake lay there for a long time. He said that was the only double brake he ever saw or heard of until David H. Baker put on a car on the New Jersey road in 1850 or 1851.

Q. 15. Who was present at the conversation at the Girard House?

A. Isaac P. Wendell.

Q. 16. After the conversation at the Girard House, where did said Wendell go?

1115 A. He went with Cudlipp and me up to the corner of the Astor House and Vesey street; I don't know where he went after that.

Q. 17. During the walk from the Girard House to Vesey street, how near was Wendell to you and Cudlipp?

A. We three walked along side by side.

Q. 18. After the interview with Cudlipp at the Girard House, did Cudlipp at any subsequent interview say anything to you about his not being able to influence Talson any one way or the other?

A. I never heard anything of the kind until I heard him testify to it.

Q. 19. You have stated what Cudlipp said about what was the first knowledge he had about double-acting brakes on the New Jersey Railroad. About when was the first time that he made to you any different statement on that subject, and what was such different statement?

A. It was in February, 1868, just before I commenced taking testimony here in New York. I called on him, expecting from what he had previously told me he knew about this brake matter that he would be one of my best witnesses. At that interview he told me that he believed they had some kind of a double-acting brake on a car on the New Jersey Road, that he was repairing a short time before he was married; that while he was repairing this brake an engine backed up against this car and broke both of his collar bones; he said he recollected very distinctly how that brake was arranged in the truck, and marked out for me on the blank leaf of a book, the brake that he was repairing at the time he was hurt. I asked him if he was positive that the little drawing that he made represented the brake correctly that he was repairing when he was hurt. He said it did; he recollected how the brake was arranged as well as though it was a month ago.

Examination adjourned to Nov. 9th, 10 a. m.

1116 NOVEMBER 9TH—10 a. m.

Present, counsel as before, and complainant in person.

Q. 20. After he had made that little drawing, did you say anything to him about it; and, if so, what did you say?

A. After he had made the drawing, I asked him if he was sure that that was a correct representation of the brake that he was repairing on the car; he said it was, and he recollected it as distinctly as though it were a month ago. I then showed him that it would be impossible for a brake arranged in the trucks like the drawing he had made, to be applied to both trucks by means of a centre lever. I showed him that if the brakes were applied or operated upon by means of the centre lever, that the brakes would be drawn from the wheels instead of being pressed against them.

Q. 21. What became of that little drawing, if you know?

A. The drawing that he made was in a book. I took a piece of paper and made an exact copy of his drawing from the book, which drawing was filed as an exhibit in this case, in M'r Cudlipp's testimony. I think it was marked "Cudlipp's Exhibit."

Q. 22. When did you make that copy?

A. At the time I had the talk with Cudlipp, at the same time that he made his drawing or a few minutes after, it was in his presence, and I made it on the book that he made his drawing on, his drawing being before me.

Q. 23. What did you make this copy for?

A. I made the copy so as to be sure and not forget the exact arrangement of the brake he had drawn, thinking at the time, as I told him, that he was mistaken about its being connected with the centre lever.

Q. 24. Do you know what has become of the drawing which Cudlipp made at that time in the book?

A. I do not; I have not seen it since that time.

Q. 25. Did you ever see a man named Isaac Dripps, and did you ever call on him; and, if so, when and where?

A. I did see him at Fort Wayne, Indiana, in the month of November, 1867.

1117 Q. 26. Please state what conversation, if any, took place between you and said Dripps at that interview.

A. I asked M'r Dripps if he could tell me when double-acting brakes were first used on the Camden and Amboy cars. He said he could not tell when they first used them there. His recollection was that they commenced using them there somewhere about 1850; that he was not positive about that even. I asked him which was first used, the Hodge brake or the centre lever brake. He said he could not tell how the brake was arranged.

Q. 27. Did he say anything to you about the Tyler car; and, if so, what?

A. I asked him if he remembered the Tyler car. He said at first that he did not; but after I explained to him of its having a privy on the platform, he said he believed he recollected something about it, but could not tell what kind of brakes it had on.

Q. 28. Did you mention your name to him at that interview?

A. I did. I introduced myself to him when I went in. I never had seen him before to my recollection. I asked him if his name was Dripps; he said it was, and I told him who I was.

Q. 29. Did you at any time in that conversation mention the name of Waterman in any way, or did you tell him that your name was Henry Waterman?

A. I do not remember that Henry Waterman's name was mentioned at all. I certainly did not tell him that I was Henry Waterman.

Q. 30. Will you state any circumstance within your knowledge that has recently occurred in Chicago in relation to the witness Patrick Flanagan, who has testified on your behalf in this case?

A. About the middle of October last I heard of a man by the name of Pat—a man that was called Pat. who was an engineer on the Chicago and Northwestern Railroad, and I was unable to learn his other name; 1118 and I went to the machine shop to the master mechanic, M'r Tilton, and he told me that his name was Pat Flanagan, and that he was on the south branch on an engine. This was some two or three miles south of the machine shop. I went immediately to the south branch to see Flanagan. When I got there Flanagan had a telegraph dispatch from this Tilton, master mechanic, telling him to go immediately down to M'r Blodgett's office; and he said he could not talk to me much there, as he must go down immediately to see Blodgett, who was the attorney of the company. I told him I would go down with him. We got in the horse-car together and went down to Blodgett's office. Blodgett was not in, and we waited until he came in. I introduced Flanagan to Blodgett, and Blodgett asked him what he came there with Sayles for. Flanagan said that he did not know anything about Sayles; he supposed he wanted to see him about a man that was killed on the road a short time before. I then told Blodgett that Flanagan had just told me that he recollected the old Tyler car well; that he had often applied the brakes on it, and that he was positively sure——

(M'r Whipple objects to what Flanagan told the witness.)

that it had the single brake on, and that Flanagan was the man whose testimony I wished to take that afternoon at 2 o'clock. Blodgett turned to Flanagan and told him that if he went and testified in the case on my request that day he could leave the company's employ at once. I told Flanagan that if the company discharged him for going and testifying to the facts in the case——

(M'r Whipple objects to what the witness told Flanagan.)

I would pay him the same wages they were paying until he got as good or better job. I asked him then to come up to M'r Hoyne, the commissioner's office, at 2 o'clock that day. He said he thought he would. This talk all occurred in M'r Blodgett's presence, in his office. 1119 M'r Flanagan did not appear there to give his evidence on that day, and on the next morning I got a subpœna from M'r Hoyne, and had him subpœnaed, and he came and gave his evidence.

Cross examined by M'r Whipple:

Cross-q. 1. There has been much testified to in this case by this and other witnesses relating to M'r Talson, and what he testified to at Albany; will you please state when you first saw or became acquainted with M'r Talson?

A. I cannot tell when I first saw him. It was, however, a short time before the suit with the New York and Erie Railroad was tried, in October, 1854.

Cross-q. 2. Where did you then see him?

A. I cannot tell whether it was in New York or in Albany that I first saw him.

Cross-q. 3. When you saw him in Albany, and before the trial in which he testified, did you have him examined by your counsel, M'r Keller, or rather the counsel for the complainant in this case?

A. I do not know that he was examined by M'r Keller; I do know that he saw M'r Keller in Albany, and told him what he knew about the matter, for I was present and heard it.

Cross-q. 4. Has not M'r Keller testified in this case that he, Talson, was brought to him, and that he had a full and careful conversation with him, Talson, in reference to the kinds of brakes that had been used on the cars of certain railroad companies in New Jersey?

A. I do not know that M'r Keller has testified to all of that. I think he has to the substance of it.

Cross-q. 5. Has he testified that he, Talson, was brought to him, Keller?

A. I think he has.

Cross-q. 6. And did this take place before he was put upon the stand as a witness for the defendant?

A. I think it did.

1120 Cross-q. 7. Was there a model put into the case by M'r Talson? If so, did that model represent a double-acting brake made up of a centre lever attached to the body of the car, with four connecting rods to connect the levers in the trucks and the windlasses in such a manner as to enable the brakeman to apply the brakes of both trucks from either end of the car?

A. There was a model put in the case by the defendant said to represent a brake put on by one Stanley, or by Talson. That model represented a brake that would apply the brakes to both trucks from a windlass at either end. I cannot recollect all the details of the mechanism of the brake. I do recollect that the brake was quite different from the Tanner brake in many respects, so much so that I thought it was not a practical brake; and whether it had one centre lever or two centre levers I am unable to say. I know it was quite complicated within the trucks. I cannot say whether there were four connecting rods.

Cross-q. 8. Have you not testified that it was your impression that there were four connecting rods represented in said model?

A. I think I have; and it is now my impression that there were, although I am not positive about it.

Cross-q. 9. Has not Samuel Blatchford testified in this case, from notes taken at the time of that trial, that the model in question exhibits a double-acting brake with lever in centre?

A. I do not remember particularly about that.

Cross-q. 10. Have you not had the notes referred to in your possession during most of the time since that trial, and yet do not remember so important a feature as the one called in question?

A. I have had the notes in my possession most of the time. I have not read them over for a long time. The notes show for themselves what they are.

Cross-q. 11. Does the Tanner centre-lever patent, so called, claim any particular arrangement of mechanism in the centre of the car?

1121 A. I do not know that it does. The letters patent will show for themselves.

Cross-q. 12. Was not the lever and the connecting rods in the model exhibited by the defendant on the trial at Albany the same as the lever and connections in the model filed in the Patent Office by Henry Tanner in 1852?

A. I think they were not exactly the same. I think there was some difference, but I am unable to state what that difference was. I do remember that that brake was so arranged that if it had been continued in practical use on the New Jersey Railroad, that my opinion was at the time that it might have defeated the Tanner patent.

Cross-q. 13. Were the two models alike in this respect, a centre lever with four connecting rods?

A. I cannot tell positively.

Cross-q. 14. What is your impression?

A. My impression is that there was a difference. What that difference was I cannot say.

Cross-q. 15. I have asked you whether they were alike in this respect, as I have already stated, a centre lever and four connecting rods?

A. I am unable to say whether they were alike or not in that respect. I think there was some difference.

Cross-q. 16. Name the difference.

A. I cannot.

Cross q. 17. In M'r Talson's testimony at Albany did he use the word abandoned?

A. I do not now recollect particularly.

Cross-q. 18. Did he say in his evidence at that time that he had testified to all he knew about double brakes while on the New Jersey road?

A. I do not now recollect that he did.

Cross-q. 19. Was there any question of this character put to him while on the stand?

A. I do not know whether there was or not.

Cross-q. 20. Was there anything in his testimony at Albany favorable to the defendant by whom he was called to testify?

1122 A. I remember that I thought at the time that there was not anything of importance.

Cross-q. 21. What he was to testify was all talked over and understood by him, M'r Keller, and yourself, was it not, before he was put upon the stand?

A. All I know about that is that I saw M'r Talson. He told me what he knew about the brake being used on the New Jersey road, and I asked him if he would not call at M'r Keller's or M'r Blatchford's room, and I told him where it was, and he said he would, and he did call there, and told M'r Keller what he knew about it, as he stated at the time that he had told all he knew about the use of double brakes while he was on the New Jersey road.

Cross-q. 22. Was Talson recalled at that trial? If so, what did he testify to on the recall?

A. I think he was recalled. I am unable now to say what he testified to when he was recalled. I have had so many other matters in my mind for the last day or two that I could not say at this moment.

Cross-q. 23. Do you know anything that he testified to in detail at that trial?

A. I do.

Cross-q. 24. Please take the matter up in detail.

A. He testified on that trial that one Isaac Newton Stanley put a brake on a car on the New Jersey road in 1842, and that it was tied up with strings. That the brake failed and did not go into use. That he afterwards took the brake off and applied it mechanically. That he strengthened it; that he added a lever; that they tried the brake; that

it ran to Philadelphia, or opposite to Philadelphia, two or three times; that it may have run more and may have run less than three times; that after it had been on the car about a week it was taken off and the single-foot brake put on in its place; that the single-foot brake was continued on all the cars up to the time he left the road, which was in August, 1849. He stated that the Griggs brake did not go into use on the road. He said that there was a double brake put on a tender
1123 which could not be operated from either end, and did not have a transverse lever under it, only single connecting rods.

Cross-q. 25. All this that you have testified to was arranged between you and M'r Talson and your counsel that he, Talson, should testify to when put upon the stand by defendant, was it?

A. I know of no arrangement. I merely asked Talson what he knew about it, and he told me, and I asked him to tell M'r Keller.

Cross-q. 26. Did he tell M'r Keller in your presence?

A. He did.

Cross-q. 27. What proceedings have you caused to be instituted against M'r Talson within the last year?

A. I have made an affidavit which was filed with a commissioner, with several other affidavits, and M'r Talson has been arrested on the charge of perjury, I believe, in regard to matters that he has testified to in this brake case, in reference to the Isaac Newton Stanley brake, or the one put on by said Talson.

Cross-q. 28. Who was instrumental in procuring the other affidavits you speak of?

A. I was myself.

Cross-q. 29. Where was Talson arrested?

A. In Chicago, Illinois.

Cross-q. 30. At whose instigation in that place?

A. The marshal here in New York told me that his deputy had seen Talson at his house in New Jersey, and Talson had agreed to come over here the next morning and give bail, but did not come as agreed, and he had heard that he had gone to Chicago. I told him I was going to Chicago, and he said that he would write a note and send a warrant to the marshal at Chicago, and he did so. He sent it by me.

Cross-q. 31. Did you give the warrant to the marshal for his arrest in Chicago?

A. I did.

Cross-q. 32. Has M'r Talson had a hearing in that case; if so, to what extent?

A. There has been some testimony taken on the part of the government. It is not yet closed.

1124 Cross-q. 33. When was this case first set down for a hearing?

A. My impression is that it was in September last.

Cross-q. 34. Who has had the management of the case on the part of the government?

A. S. D. Cozzens.

Cross-q. 35. Have you also been an active party?

A. I have.

Cross-q. 36. Is S. D. Cozzens pecuniarily interested in the Tanner patent?

A. I understand that he is somewhat in the extension of the patent.

Cross-q. 37. Has the United States attorney had anything to do with this case; that is, in taking proofs?

A. I do not think he has.

Cross-q. 38. Have you called upon John H. Jobes, a witness for defendant in this case?

A. I have seen him.

Cross-q. 39. For what purpose?

A. I called on him for the purpose of ascertaining whether he was sure as to the time he first saw a double-acting brake on the New Jersey road, and he told me that he was not positive as to the time; it might have been earlier and it might have been later than he stated in his testimony given in this case; and I had thought of calling him as a witness in this brake case.

Cross-q. 40. Did he state to you that he was in doubt whether the brake testified to by him was used in Talson's time or in Baker's?

A. I do not now recollect particularly what he said about that.

Cross-q. 41. If the brake was used in Talson's time, why should you wish to call him as a witness?

A. I had my reasons for wishing to call him, as I had been advised by my counsel in regard to the testimony of many other witnesses that had been examined by the defendant, and I think that it would be hardly proper for me to state to the counsel of the defendant what my
object might have been in calling him.

1125 Cross-q. 42. Was not M'r Jobes very clear in his mind that the
brake to which he has testified in this case was used in Talson's
time; that is, prior to August, 1849?

A. I do not remember particularly what he said as to the time it was used, only that it might have been earlier or later than he stated in his testimony that he thought he saw it.

Cross-q. 43. Have you seen James S. Gamble, a witness for defendant in this case? If so, for what purpose?

A. I have seen him, and for the same purpose that I saw Jobes.

Cross-q. 44. What did you learn from him about the use of a double brake on the New Jersey road while he was conductor on the Philadelphia train?

A. He told me he thought there was a double brake on a car on the train on which he was conductor.

Cross-q. 45. Did he express himself as having any doubt in his mind as to whether there was such a brake in use in the time spoken of?

A. I do not know that he did.

Cross-q. 46. What other witnesses have you seen who have testified for the defendant in relation to the use of double brakes on the New Jersey Railroad?

A. I saw Bernard Hughes some time last spring, only for a few moments. I asked him if what he testified to in Albany, in 1854, was true. He said it was; every word of it.

(Answer objected to as not being called for by the question.)

I do not now remember of seeing any others that testified particularly as to the New Jersey brake on the part of the defendant.

Cross-q. 47. Have you seen any witnesses who have testified for defendant in this case of the use of a double brake on the Camden & Amboy road? If so, whom, and for what purpose?

A. I have. I have seen Joseph Capner, John Conover, William
1126 Coulter, Charles Cox, Henry H. Disbrow, Thomas Herburt,
George Stockham, George W. Thompson, Charles Yundt, and
Richard C. Wolcott. I may have seen some others. I had understood that some of these men had changed their minds since they were examined as witnesses; that they thought that they were mistaken in some portions of their testimony, and I called on them to ascertain what their

present recollection of the facts in the case was, and, if I found that the change would be any benefit to me, my intention was to call them as witnesses.

Cross-q. 48. Name those witnesses who have changed their minds since giving their evidence in this case.

A. I believe Charles Yundt, Joseph Capner, Henry H. Disbrow, and Richard C. Wolcott have somewhat changed their minds, and have so testified, or their testimony will show whether they have changed their minds or not. I believe those are all that I remember.

Cross-q. 49. Any of these witnesses already named do you intend to call? If so, name them.

A. I do not know whether I shall or not; it will depend on the advice of my counsel.

Cross-q. 50. Do you intend to call John Conover?

A. I have not decided to.

Cross q. 51. Have you decided not to?

A. I do not know that I have decided anything about it.

Cross-q. 52. Do you intend to call any of the witnesses herein named to testify in Philadelphia to-morrow, or thereafter, as soon as parties can be heard?

A. I do not know whether I shall or not. I have not decided to. It will depend on circumstances.

Cross-q. 53. Who informed you that some of these witnesses named by you had changed their minds since they had testified?

A. Friends of mine, whom I do not wish to name.

Cross q. 54. You will please name them.

A. Some of the parties are in the employ of the New Jersey railroads,
and did not wish to have their names mentioned in the matter, as
1127 it might get them into trouble with their employers; therefore I
do not wish to name them.

Cross-q. 55. Does this change of mind in the witnesses named by you amount to a contradiction of what they had already sworn to as being the truth in the case?

A. That is not for me to decide. The testimony will show for itself.

Cross-q. 56. Have your friends been instrumental in working upon the minds of these witnesses with the view to induce them to contradict their evidence already given?

A. Not that I know of.

Cross q. 57. Have you been instrumental in any work of this character?

A. I do not know that I have. I have talked with some of the men, and have asked them what their present recollection of the facts was, and have asked them to come and testify to it, and they have done so.

Cross-q. 58. Then no undue influence over these men has been exercised by you or your friends to induce them to testify, has there?

A. Not that I am aware of.

Cross-q. 59. Have you sworn truly on all points on which you have been interrogated in this case?

A. I have, according to my best recollection of the different matters as I have testified.

Re-examined by M'r Cozzens:

Redirect q. 1. Have you caused inquiries and efforts to be made to find the model which was put in by the defendants at the Albany trial in 1854? and, if so, state what the result was.

A. I have; and have never been able to learn anything about what had become of the model.

Redirect q. 2. State what, if any, advice M'r Keller gave you at or before the Albany trial, in reference to the effect in the case of the Isaac Newton Stanley or Talson brake; and state what legal reasons, if any, he gave you as the grounds of such advice.

(Objected to.)

1128 A. M'r Keller told me at the time before the trial, or at the time of the trial, that inasmuch as the trial of that brake was a failure, that the court would hold it as an abandoned experiment, and he thought it would not affect my patent; but he said that although it was quite different from the Tanner brake, if it had continued on the road in successful use, it might have defeated my patent.

And being further cross-examined by M'r Whipple, he deposes and says:

Recross-q. 1. What did John Conover say when you called upon him?

A. He said he thought there was a double brake on the Tyler car at the time Tyler took his trip over the road. He said that he did not think that he was mistaken, and yet it was possible that he might be.

Recross-q. 2. Did he think it very probable that he was mistaken?

A. I do not know that he said as to that. He seemed to think that he had testified as to the truth in the matter.

Recross-q. 3. What did Charles Cox say when you called upon him?

A. He said, after reading over his testimony, as I showed it to him as it is printed in defendant's testimony, that he did not see how he could change his testimony very well, as he had testified that he saw the wheels of the car slip on the track, while he was on that road, and he left there, I think he said in 1850. He said he could not tell whether it was the Hodge brake or the centre-lever brake.

Recross-q. 4. What did Thomas Herbert say when you called on him?

A. He said but very little; he was busy; and I do not think I talked with him more than ten seconds. I asked him a question, and he went under a car to attend to something, and as I was in a hurry I left as he went under the car.

Recross-q. 5. What relation, if any, between Thomas Herbert and the one who has testified in this case?

1129 A. I do not know.

Recross-q. 6. What did George Stockham say when you called on him?

A. I did not call on him; I met him accidentally at a hotel in Bordentown. I do not remember particularly.

Recross-q. 7. Did he say anything favorable to the complainant in this case?

A. I do not remember that he did.

Recross-q. 8. What did George W. Thompson say when you called on him?

A. I met him at the hotel in Bordentown, also. We talked some in regard to the testimony in this case. He said he had testified according to his best recollection. He said that it was very evident that some of the witnesses were mistaken, and he said he did not know which side it was.

Recross-q. 9. Did he say to you that he thought he was mistaken in the evidence he had given?

A. He did not. He said it was possible he might be; but he had testified to his best recollection at the time.

Recross-q. 10. Did he use the word "possible"?

A. He did, and at the same time said he hardly thought he was mistaken; he certainly testified to the best of his recollection at the time.

Recross-q. 11. Have you named all the witnesses that have been examined by the defendant in this case, called upon by you to see if they had not changed their mind?

A. As I stated before, I may have seen others.

Recross-q. 12. Do you intend to call as a witness any one whose name you have not mentioned?

A. I expect to see some to-night, or to-morrow morning, that have been called by the defendants, and after I see them I shall decide whether to call them or not.

Recross-q. 13. Please name them.

A. I had rather not name them just now.

Recross-q. 14. I insist.

A. And I refuse.

Recross-q. 15. Was one of your informing friends named William Quigley?

1130 A. No, sir.

Recross-q. 16. D. T. Jeffries?

A. No.

Recross-q. 17. Has he been lately discharged from the Camden and Amboy road?

A. I do not know if he has.

Recross-q. 18. Do you know that he has not?

A. I do not know that he has not.

Recross-q. 19. Is Henry Waterman one of your informing friends?

A. No; I think not.

Recross-q. 20. Do you know that he is not?

A. I do.

THO'S SAYLES.

Subscribed and sworn to before me this 9th day of November, 1868.

JOSEPH GUTMAN, J'R,
Examiner, &c.

PHILADELPHIA, *Nov.* 10, 1868.

WILLIAM CRIM sworn.

(Counsel for defendants objects to any further examination of this witness at this stage of the case.)

Q. 1. Have you been examined before in this case on the subject of brakes on the Camden and Amboy road?

A. Yes, sir.

Q. 2. Was that examination in New York?

A. Yes, sir.

Q. 3. When you were returning home from the examination, who was with you?

A. Charles Yundt.

Q. 4. When so returning with said Yundt, did you talk over your examination in New York; and, if you did, did you come to any conlusion about it; and, if so, what was the conclusion?

1131 A. Yes, sir; we did talk it over. We were talking it over, and I told Yundt I thought we were both mistaken. We had both spoken about the double brakes, and I told him I thought they were not connected so that one truck would work with the other; they were separate brakes. After I came home I studied the thing over so that I might be certain. I don't know that I am certain yet. I was in the Camden and Amboy yard and I thought I would just look at the cars and see whether I was mistaken or no; and I examined them and found the long rod running clear through the car—the brake-rod—and I came to the conclusion that that rod was not there—that is, was not on at the time that I was on the Camden and Amboy road.

Q. 5. Now that you have so thought the matter over, state what kind of brake you now say was on the car you spoke of in your examination in New York, on which the rod fell down on one of the excursion-trains, and also what kind of a brake was on the John Tyler car, which you also spoke of in said New York examination.

A. Well, sir, it was called a double brake. But this double brake, as it was called, had a brake at both ends of the car, and each brake was separate, and one brake didn't brake all the wheels—both trucks—one brake broke on one truck. One brake could only stop the wheels in the truck. If there were three pair of wheels in the trucks the brake would brake on the front and back wheels.

Q. 6. Then, will you now say whether, while you were on the Camden and Amboy road, there were any brakes on the cars of that road in which one brake would brake all the wheels of the car from one end of the car?

A. I can't say certainly. I don't think there were any while I was on the road. I left in 1850.

Q. 7. Will you state what was the first brake acting on all the wheels of the car, from one end of the car, which you ever saw, and state whether it was before or after you left the Camden and Amboy road that you saw it?

1132 A. The first I think I ever saw, to the best of my recollection, was on the Camden and Atlantic road where I am now; that I took notice of this was as after I left the Camden and Amboy road.

Q. 8. Please state whether there is any model now present which is like the brake you so saw on the Camden & Atlantic road.

A. It was not like this model (Hodge brake), but was like the Stevens brake, the levers being upright in the trucks, and being connected through by one rod so as to work from either end.

Q. 9. Will you state how many brakemen you now say were required to put on all the brakes at the same time on the John Tyler car, and on the car on which the rod fell down on the excursion-train, and which two cars were spoken of by you in your examination in New York?

A. It took two brakemen, one on each end. If one man did it he would have to run through the car.

Cross-examination waived by counsel for defendants.

WILLIAM CRIM.

Sworn to and subscribed before me this 10th day of November, 1868.

W. GRIER HIBLER,
U. S. Commissioner.

ASHER PENCOST produced and sworn.

(Any further examination of this witness at this state of the case objected to by counsel for defendants.)

Q. 1. Have you before been examined in New York on the part of the R. R., the defendants in this case?

A. Yes, sir.

1133 Q. 2. Will you state whether, since you were so examined, you have thought this matter over; and, if so, state whether your reflection upon it has caused you in any respect to change your mind on the subject.

A. I have thought the matter over, and I have talked with my old comrades who was with me on the road at the time, which has convinced me that the brake on the Tyler car in 1843 was not connected; there was two ends, and a brake on each end, but was not connected in the centre, to the best of my knowledge.

Q. 3. How many trucks do you now say one of these brakes on the Tyler car would brake on?

A. To the best of my knowledge, one.

Q. 4. About what year, as nearly as you can state, do you now say the first double brakes, connected so that one man from one end of the car could apply all the brakes at one time, were used on the Camden and Amboy road?

A. I think I should say about 1852 or 1853; I can remember that; I can't say certain—somewhere about there.

Q. 5. Please state who talked to you about these double brakes being connected before you was examined in New York, and from whom you first got the idea that these brakes were so connected in 1843, and afterwards?

A. M'r Andrew Rybow; he is car inspector of Camden and Amboy road, at Camden.

Q. 6. What did he say to you about it?

A. He asked me if I didn't remember the Tyler car. I told him I did; that I was brakeman on it when John Tyler went through. He then said M'r Edwin Lockwood wanted to see me, and asked me when I would be home; I told him on Thursday night. M'r Lockwood did not come, but sent M'r Ryhow; he was in my house. We had quite a talk about the brake. I told him I couldn't tell exactly; it was a double brake, but I couldn't tell exactly. He then said M'r Lockwood would send me a pass to go to N. Y. I told him that I didn't think I could be of much service to him, as I didn't remember much about it.

Q. 7. Did M'r Ryhow say anything about there being a suit pending about these brakes?

1134 A. Yes, sir; well, I could not tell exactly what he did say. He said there was a suit; that these parties had sued the Camden and Amboy Company, claiming $50 a car for every car it was used on; and then he began to count up how much it would come to; he said how much it come to, but I don't recollect how much.

Q. 8. Did he say anything about it being important for the Camden and Amboy Co. to defeat the patent; if so, what did he say?

A. Yes, sir. I don't recollect what he said. I recollect he said it was a big thing for the company.

Q. 9. Did he say anything about what would happen if the patent was not defeated?

A. I don't recollect his saying anything about it.

Cross-examination waived by counsel for defendant.

ASHER PENCOST.

Sworn to and subscribed before me this 10th day of November, 1868.

W. GRIER HIBLER,
U. S. Commissioner.

JAMES SEEDS produced and sworn.

(Further examination of this witness objected to by counself or defendants.)

Q. 1. Have you been examined before in this case?

A. Yes, sir.

Q. 2. Since you was so examined have you thought over this brake matter, and, if so, will you please state when, you now say, to the best of your recollection, you first saw on the cars of the Camden and Amboy R. R. a brake so constructed that one man could apply all the brakes of the car at the same time from one end of the car?

1135 A. Somewhat, sir. I think, sir, it was somewhere from 1851 to 1855 that I first saw such a connected brake.

Q. 3. Before this time had you seen cars on the Camden and Amboy road which had a brake on each end of the car, but which brakes were not connected?

A. Yes, sir.

Q. 4. What did the R. R. hands call these brakes?

A. Well, I have heard them called double brakes; but I don't recognize them as double brakes unless they are connected.

Q. 5. With these so-called double brakes which were not connected, how many men did it take to apply all the brakes of the car at the same time?

A. It would take two, sir; one at each end.

Cross-examination waived by counsel for defendant.

JAMES SEEDS.

Sworn to and subscribed before me this 10th day of November, 1868.

W. GRIER HIBLER,
U. S. Commissioner.

1136, 1137

1138 *Testimony on the part of complainant, taken at Buffalo, January 21st, 1869.*

Present, S. D. Cozzens, esq., counsel for complainant, and S. M. Whipple, esq., counsel for defendant.

THOMAS P. GROSVENOR, being called and sworn, deposes as follows:

1. Question. What is your name, age, residence, and occupation?

Ans. Thomas P. Grosvenor; age, 49; reside in Buffalo; am a counsellor-at-law.

2. Question. Do you remember an action at law brought in the name of Henry Tanner, upon what is called the Tanner car-brake patent, against the New York and Erie Railroad Company, and tried in Albany in 1854, and were you one of the counsel engaged in that trial on the part of the railroad?

Ans. I remember the action, and was one of the counsel for the defendants.

3. Question. Will you state whether you took any part in the preparation of that cause for trial on the part of the defendant? and, if so, please state fully what you did.

Ans. I took part generally in the preparation of the cause for trial, in connection with M'r Charles Daniels, my associate. He was the attorney of record for the defendant. I was principally charged with the duty of looking up the evidence for the defence. I had pretty much the whole charge of that branch of the case. My course of operations was correspondence with such persons and companies as I thought would be most likely to give me information on the subject, and visiting different portions of the country for the purpose of acquiring information from different persons and companies on that subject, procuring models, and drawings of different inventions of that kind.

4. Question. Will you please state what parts of the country you visited in the course of these investigations?

Ans. I went to North Adams, Mass., and saw Nehe- [NOTE BY THE

PRINTER.—Pp. 386, 387 of printed and 1520-1527 of original 1139 record missing.] claimed then that Isaac Newton Stanley put this brake on in the fall of 1842, and that he, Talson, subsequently made some improvement in the manner of fastening the brake to the cars, and the application of it.

14. Question. Please state, if you recollect, what Talson, and also what Hughes, testified to respecting this brake on the N. J. Railroad, at the trial in Albany?

Ans. Talson stated that Stanley applied that brake to one of the cars. He stated that it was not properly applied, and it broke; that they undertook to lengthen it out with strings, and they were not strong enough to hold it, and it broke. He stated that he subsequently made an application of the same brake to a car of the same company, making the rods stronger. He said that that operated the same as the Tanner brake. That car they ran on the road to some extent, to Philadelphia, or Camden, opposite Philadelphia. Talson or Hughes stated that it was run to Camden three times, I think, and that it was then removed from the cars and given up. I think one gave as the reason why it was given up, that Smith was in favor of the Griggs brake, because it operated from the engine and saved brakemen. One gave as another reason, that owing to the rate of speed, it was unnecessary to have that kind of brake. I don't know which one gave that reason; there was a mixing up in the testimony about the reasons for giving it up. The witnesses differed about the reasons. They testified that this brake was continued in use on their eight-wheeled tenders, operating on one end, but don't recollect that they stated how long.

15. Question. Did they, or not, state that these tenders had any intermediate lever between the two trucks of the tender?

Ans. I don't recollect that they did, or did not. With reference to the car, they stated that there was an intermediate lever.

16. Question. How full and thorough were your investigations in New Jersey with reference to this brake on the N. J. Railroad?

1140 Ans. I made as full and thorough investigations as I thought the subject demanded. I did not see Talson until after my return from Trenton; had I seen him, I probably should not have gone to Trenton. When I saw Talson he claimed to know all about it.

17. Question. Did you hear from Talson, or from any one else, in any of your investigations, anything respecting the use upon the Camden and Amboy R. R., or any other R. R. in New Jersey, of any brake like the Tanner brake, except this brake you have spoken of?

Ans. I did not hear anything about any other brake being used.

18. Question. You have stated that Nehemiah Hodge visited several places in New England in company with you, in the course of your investigations preparatory to the Albany trial. Do you remember what year it was, or how long before the trial it was, that he went with you to these places?

Ans. I think it was in the fall of 1853.

19. Question. Was he aiding you in looking up evidence in the case?

Ans. He was. He was the licensor of the right to use his brake to the N. Y. and Erie R. R. Co.; that was what they were sued for. It was claimed that that was an infringement of the Tanner patent, and we called on him to help defend us.

20. Question. How active a part did he take in thus helping you?

Ans. He went with me and was as active as I was in hunting up the witnesses. I think he did not go to Hartford or New Haven with me;

he was with me at Green Island. He went with me to some other places. He was present at the trial.

21. Question. Did he make suggestions to you in aid of the defence in the Erie suit?

Ans. Yes; he counseled with me about it, and gave me a pamphlet he published on the subject.

22. Question. Did you, at any time, hear from Hodge or receive from him any hint or information that a brake like the Tanner brake had been in use on any railroad in [NOTE BY PRINTER.—Two pp. of printed record (390, 391) and pp. 1536–1543 of original record missing.]

1141 ing the same, that they ran trains very slowly at that time, and did not require such a brake?

Ans. That was the reason assigned by some of the witnesses or one of the witnesses; I can't recollect which—either Talson or Hughes; I think it was Hughes.

38. Question. Did Talson claim that the brake he put on operated as effectually, while it was used, as the Tanner brake?

Ans. He claimed it operated precisely like it. I recollect of asking Talson this question in reference to this brake—if it operated precisely as the Tanner brake, why it was subject to these break-downs—why it should break when operated, as the Tanner brake was not subject to do. His reply was, that it was because it was not properly constructed; that the materials were not of sufficient strength, and that in applying new machinery that you could not always tell what particular strength to give particular parts, and that it was an experiment.

39. Question. What value or consideration did you give to this information you had elicited from M'r Talson?

Ans. I regarded it as important evidence in the case.

40. Question. Did you view it in the light of an experiment?

Ans. No, sir; for I had supposed that the brake had been used on the cars of that road up to that time.

(Answer objected to.)

41. Question. From your conversation with Talson, were you led to believe that the brake had been in continued use on that road?

Ans. He told me so. He swore it on the trial, too—it was on the eight-wheeled tenders. Talson said to me, "We are using that brake now." At the trial he swore that they afterwards used it on their eight-wheeled tenders, with the brake at one end. I had got the impression that it was used on their cars.

42. Question. Did you have any conversation with Talson, at Albany, before he was put upon the stand to testify?

Ans. Yes, sir.

1144 43. Question. If so, what did you expect him to testify to from such conversation?

Ans. I don't know as I could answer any more correctly than by saying that I expected him to testify to just what he did testify to. I was not disappointed in his testimony when it came out.

44. Question. Was he recalled after he was first put on the stand to give further testimony?

Ans. I don't recollect that he was.

45. Question. Are you sure that the defendant did not recall him?

Ans. I am not sure about that; it may have been so: it was so long ago, I should not recollect about that.

46. Question. Do you think that he was recalled by defendant?

Ans. I have no recollection on that point; I have no reason why I should think so. I have referred to Judge Daniels' minutes, and did not find in them that he was recalled by defendant, but they might not show it; the testimony might have been added right on.

47. Question. On what special matter did you, as counsel for the defendant, most rely on the trial of that case?

Ans. We relied upon the Nichols brake and the Isaac Newton Stanley brake, as testified to by Talson and others. We did not go to the jury on the Springfield brake. The judge took that question from the jury, and it was excepted to by the defendant's counsel.

48. Question. Was the question of abandonment by Bachelder & Thompson for the five years for which their application lay in the Patent Office, before a patent was granted to Tanner, as assignee, raised and argued by defendant's counsel in this case?

(Objected to.)

Ans. I have no recollection of it.

49. Question. Were all the papers in the case on file in the Pat-
1145 ent Office in reference to the application of Batchelder & Thomp-
son put into the case by the defendants, or any of them?

(Objected to.)

Ans. We procured our copies from the Patent Office. Whether they were all the papers or not, I can't say. I had no other information than the usual certificate with the papers. I can't recollect whether they were all put in or not.

50. Question. What was the result of the trial?

Ans. A verdict in favor of the plaintiff.

51. Question. For how much?

Ans. The damages were agreed upon at $75.00, I think.

52. Question. Thereafter, was there a bill of exceptions filed?

Ans. Yes, sir.

53. Question. What disposal was made of it?

Ans. I can give you no other information than what I have derived from other sources. I have no information on that subject except hearsay. I have heard that it was compromised, and from Henry Tanner and others.

(Answer objected to.)

54. Question. Was there ever a trial had on this bill of exceptions?

Ans. Not as I know of.

55. Question. At the time of the trial, you were practicing as an attorney in patent cases?

Ans. No, sir.

56. Question. Was your associate M'r Daniels?

Ans. I don't know about that; the papers were sent to me at Dunkirk; I was the general counsel at that end of the road. Not being a patent lawyer, I was unwilling to undertake it. A few days after that I was coming down with M'r Minot on a train to Buffalo; well, I so
informed him, and on consultation here between ourselves and
1146 other people, it was finally concluded to hand the papers over to
M'r Daniels. I supposed at that time this was the last I should have to do with the case, but subsequently to this, by direction of M'r Minot or M'r Ramsdell, I was called upon to go off and work up the case.

57. Question. Was M'r Daniels at that time a practitioner in the trial of patent cases?

Ans. I don't know.

58. Question. Did the officers of the N. Y. and Erie R. R. Co. take any interest in the case after passing it over to your hands, and through you to Judge Daniels?

Ans. I can't state what amount of interest they took in it, except by their actions; by their directions I worked up the case.

59. Question. What were their actions?

Ans. They directed me to take hold of the case and work it up; at the time of the strike on their road they felt interested enough to pay $1,400 or $1,500 to put the cause over the term.

60. Question. Did the verdict of the jury in this case amount to anything more than the simple verdict for $75.00?

(Objected to.)

Ans. I suppose the effect of it was to establish the plaintiff's rights.

61. Question. Did the jury say anything more in their verdict than that they find for the plaintiff $75.00 damages?

(Objected to.)

Ans. I don't know.

62. Question. Did they find anything more than $75 damages?

(Objected to.)

Ans. They did not.

1147 **Redirect:**

63. Question. In reference to your answer to the 41st cross-question, did Talson tell you that this brake on the New Jersey road was continued in use on any car?

Ans. I don't think he did, but I got that impression from what he said when I saw him at Jersey City; after telling me the history of the brake as applied to the car by Stanley and himself, he told me that they continued to use that brake; I inferred that it was upon cars, but when he came to Albany to testify, I learned to the contrary—that it was upon the 8-wheeled tenders that the brake was continued in use.

Recross:

64. Question. Did you understand from M'r Talson that this brake upon the 8-wheeled tenders operated upon all the wheels from one end?

Ans. I did, but that it had but one windlass.

T. P. GROSVENOR.

Subscribed and sworn to before me this 21st day of January, A. D. 1869.

H. D. FITZGERALD,
United States Commissioner.

Defendant's counsel makes no objection to the foregoing deposition because it is taken before a United States commissioner.

H. D. FITZGERALD,
U. S. Commissioner.

Testimony on the part of complainant taken at the city of New York.

JANUARY 25, 1869—11 a. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

1148 **DAVID H. BAKER**, recalled (as a witness for the complainant, being further examined by M'r Cozzens, deposes and says as follows:

1. Q. M'r's Mary A. Cudlipp has testified in this case that she heard a conversation at her husband's house, on a Sunday, between yourself and her husband, J. E. Cudlipp, and that in that conversation you asked,

"Was there a man here to see you (J. E. Cudlipp) about a patent brake?" Did you say so?

A. I don't think I did.

2. Q. Did J. E. Cudlipp reply to you that there was, and that the man said you (the witness) sent him?

A. No; he did not, to my knowledge.

3. Q. Did you say to Cudlipp, "I told him (the man) if any man could have any influence with M'r Talson, he (Cudlipp) could"?

A. I did not.

4. Q. Did you say to Cudlipp, "There is money in that; if you and Talson are a mind to play your cards right, you can make something out of it"?

A. I never mentioned Talson's name to my knowledge; I am certain of it.

5. Q. Did you say anything about playing cards right?

A. I don't think that I ever used that expression.

6. Q. Did you say, "You and Talson are not employed (on the railroad), and you might as well make what you can out of it"?

A. I do not think that I ever used Talson's name.

7. Q. Did you say anything about wanting nothing to do with it because you were employed on the railroad?

A. I think it is likely I did, for I have said it often.

8. Q. In so saying what have you meant, and in so saying to Cudlipp, what did you mean?

A. I meant just what I said, that I did not want anything to do with it. I meant that towards him and to others.

9. Q. State why you wanted nothing to do with it.

A. Because I was employed by the railroad company.

1149 10. Q. State what it was that you wanted nothing to do with, because you were employed by the railroad company.

A. It may be only an opinion of mine; but I supposed I was not going to do them any good, and I did not want to go against my employers.

11. Q. When you have testified in this case have you done so voluntarily or have you been called against your will?

A. It has been against my will all the way through.

12. Q. You have said that you did not mention the name of Talson to Cudlipp. Did you say anything to Cudlipp in the conversation referred to about his "playing his (Cudlipp's) cards right," or anything to that effect?

A. I don't think I used the expression, "playing his cards right." I might have told him that there was money in the concern, and that if he had anything to do with it he would get his pay for it as he went along.

13. Q. What or whom did you refer to by the "concern," and what kind of services did you mean that he would get his pay for?

A. I meant that if he was employed by Sayles or any party, that he would be paid for it and ought to be paid for it. I meant that if he was employed by Sayles in assisting him to look up testimony he would get his pay for it.

14. Q. Did Cudlipp say anything to you in this conversation about Sayles having told him that he, Sayles, wanted him to assist him in looking up testimony? If so, what did he say?

A. I think that is about what he told me; that Sayles wanted him to assist him in looking up testimony; that is how I came to make use of the expression, or something to that effect. He may not have used exactly those words; that is what I understood from him.

And being cross-examined by M'r Whipple, he deposes and says as follows:

1. Cross-q. Was the interview above referred to at Cudlipp's
1150 house, on Sunday, the only one that you ever had at the house of
said Cudlipp on Tenth avenue, at the corner of 69th street?

A. I think it is the only one I ever had there with him; I called at his house there once, but he was not at home.

2. Cross-q. Is this interview the only one on this subject that you have had with him at his house, as above stated?

A. I did not go there for that subject at all; I did not go there to have an interview with him on the subject; I merely called there on a friendly visit.

3. Cross-q. Have you been in the habit of frequently calling on M'r Cudlipp on friendly visits?

A. I have called on him at his house in Seventh avenue and also in Jersey City, and have been intimately acquainted with him.

4. Cross-q. How comes about this intimate acquaintance?

A. He was a young man that was employed by the New Jersey Railroad Company when I went in charge there. He got married while he was there. I recommended him to M'r Jackson for a berth as conductor that was vacant on the road, and he got it. He was at that time considered a smart, active young man, and was a great deal thought of by the officers of the company. We bought lots in Jersey City, on one block, right behind each other. He came to me and wanted me to go into business with him, and offered to put in from $10,000 to $20,000, if I would go into business with him; and upon the whole we have been as intimate as two men could be together, in different places.

5. Cross q. In what year did he offer to go into business with you?

A. Somewhere about 1861 or 1862. I am not certain about the time—just before he moved up to the place where he is now.

6. Cross-q. How long before the interview of Sunday, alluded to by you in your evidence, did you have an interview with him at his house
in Seventh avenue?
1151 A. I cannot state the exact time. I could not tell, perhaps,
within a year. I did not charge my mind with it. It was just
before he moved away from there, I think somewhere about 1862 or 1863. I cannot tell certain about it. I have seen him several times since, at my shop and at my house. He stayed to tea at my house since I talked to him about the brake.

7. Cross q. Have you called upon him at his house since 1860, at any other times than the call you made on him in Seventh avenue, and in Tenth avenue, corner of 69th street?

A. I called twice at 69th street. Once he was at home, and once he was not.

8. Cross-q. Then you called upon him but three times since 1860?

A. That is all that I can remember. I have met him often.

9. Cross-q. How often?

A. I could not state; two or three times; it may be more, it may be less. I think it was more than that. He came twice to see me about this partnership business.

10. Cross-q. Were you examined for the complainant in this case in his suit against the Philadelphia, Baltimore and Wilmington Railroad about the year 1860?

A. I do not think that I was. I cannot remember it. I was examined two or three times, but I do not think that it was in that suit.

11. Cross q. Are you sure that you was not examined in that suit?

A. I am not sure of it. I do not think that I was. I have no recollection of it. If it is in that book, and the book is correct, then I was examined in that suit. Yes, I was sworn in that case, as I find by looking at the testimony in the book.

12. Cross-q. Was you a willing witness in that case?

A. I do not know that I made any objections to being sworn at that time.

13. Cross q. Were you examined in the application of Bachelder and Thompson and others, in the matter of the extension of the Tanner patent, now at issue in this case?

1152 A. I was.

14. Cross q. Were you a willing witness on that occasion?

A. I do not think that I had any objections to coming.

15. Cross-q. How many times have you been examined in this case?

A. This is the third time, I believe.

16. Cross-q. Have you been a willing witness each time?

A. What do you mean by a willing witness?

17. Cross-q. I mean, have you come upon the mere request of the complainant?

A. I have never come on the mere request of the complainant. I have objected to coming every time.

18. Cross-q. Have you been subpœnaed at each time that you appeared in this case?

A. I have.

19. Cross q. Were you subpœnaed in the other cases in which you have testified?

A. In one I know I was. In the other I am not sure, but I think I was.

And being re examined by M'r Cozzens, he deposes and says:

1. Redirect q. Since the matter of your testimony in the Philadelphia, Wilmington and Baltimore R. R. suit has been inquired about on the other side, I will ask you whether or not you stated in that testimony that the first double-acting brake put upon the New Jersey Railroad and Transportation Company's road, to your knowledge, was built and put on by yourself, with the assistance of the men on the road, in the fall of the year 1851?

A. There is no doubt about it.

2. Redirect q. Did you testify the same thing in the deposition given by you on the extension-application referred to on the other side?

A. I think I did.

1153 **And being further cross-examined by M'r Whipple, he deposes and says:**

1. Recross-q. Do you know what brakes were in use on the New Jersey Railroad and Transportation Company's cars and on the cars of the Camden and Amboy Railroad Company prior to August, 1849, when you took charge of the car department of the former company?

A. Only by what brakes were on when I took charge. They all had brakes on when I took charge.

2. Recross-q. Do you know what brakes were in use on all the cars of the Camden and Amboy Railroad Company when you took charge?

A. I do not.

D. H. BAKER.

Subscribed and sworn to before me this 25th day of January, 1869.

JOSEPH GUTMAN, J'R,
Examiner, &c.

WILLIAM COULTER, called as a witness on the part of complainant, being examined by M'r Cozzens, for complainant, deposes and says as follows:

1. Q. State whether, from the circumstances which occurred in relation to the brake of the Tyler car, as you have heretofore testified in this case when the crank flew around and hit your hand, you could tell whether that car had on it a double-acting brake or a single-acting brake?

A. That would be impossible for me to tell.

And being cross-examined by M'r Whipple, he deposes and says as folllows:

1. Cross-q. What kind of a brake do you think there was on that car?

1154 (Objected to.)

A. It is impossible for me to tell.

W. COULTER.

Subscribed and sworn to before me this 25th day of January, 1869.

JOSEPH GUTMAN, J'R,
Examiner, &c.

STEPHEN W. REILLY, a witness produced on the part of the complainant, being examined by M'r Cozzens, deposes and says as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Stephen W. Reilly. I am 29 years of age. I reside at Newark, N. J. I am a clerk by occupation.

2. Q. Were you ever in the employ of the New Jersey Railroad and Transportation Co.? If so, when, in what capacity, and for how long?

A. I was, as clerk in the general ticket department, from 1856, I think, to 1862.

3. Q. Do you know a man by the name of Jonathan E. Cudlipp, who was formerly in the employ of said company?

A. I knew the ticket agent at the foot of Courtlandt street. We used to call him Ed. Cudlipp.

4. Q. Was that man discharged from the employment of the said railroad company?

A. Virtually, he was. He was given time to resign, to find other employment.

5. Q. What year was this? and state, as briefly as you can, the circumstances which led to it.

A. The year I cannot remember. It was somewhere about 1859 or 1860. I was acting as second clerk in the general ticket department at Jersey City. Through a concerted plan with the head 1155 clerk, M'r Cudlipp received for each week-day a certain number of tickets for certain stations on the road, over and above the regular number alloted to his station. The extra issue of tickets was sold by M'r Cudlipp, and a like number that had been collected in the cars by the conductors, when delivered in the general ticket office, were destroyed by the head clerk mentioned above, so as to not have any evidence of their issue. In time, the head clerk was found as the party issuing the tickets in this manner. Each Wednesday and Saturday were the days for delivering the quota of tickets to each office for the three

following week days. We found each day that more tickets were being received than the sales at New York station called for. We also found that the head clerk was destroying tickets which had been collected by conductors, which should have been destroyed on the following day. I watched the head clerk for some months—I think about three months; and was satisfied he was in collusion with some party—then I did not know whom. I told the general ticket agent; he told the general superintendent, and I was ordered to watch further. I wish to be understood that I complained then of the head clerk. After the tickets were made up on Tuesday for the delivery on Wednesday by the head clerk, and when he was gone home, the general ticket agent and myself would take the tickets to be delivered to M'r Cudlipp on the next day, and make a private mark on the tickets that were to be delivered to him. We found, when he returned his packages, that all he returned had our private mark put on. Still tickets were being received in the cars from passengers going from New York without this mark. M'r Gwinner, the general ticket agent, went with the conductor of a certain train, and each passenger having tickets without that private mark was examined as to where the purchase of said ticket was made—the description of the seller, whether they had purchased tickets there before, and also the name and residence of the passenger. On one train he found six passengers, all of whom stated that they had bought their tickets at the
1156 regular office; two passengers of whom had bought there before.

M'r Gwinner, the general ticket agent, reported this to M'r Jackson, the vice-president and general superintendent. Immediately he called the chief clerk to his office and accused him of overissuing tickets, and demanded the names of the parties with whom he was in league. M'r Gwinner told me that he had confessed to all, but wished that it might not be made public; that he would return what he had taken, as he then had money in the bank to the amount of $1,500 or $3,000, and that Cudlipp was in with him. He also gave to M'r Gwinner the number of each kind of tickets which he issued each day over and above Cudlipp's quota. M'r Jackson, with this clerk, went to Cudlipp's office. Cudlipp denied having received any tickets from this party. The chief clerk reiterated that Cudlipp was his accomplice. M'r Jackson, so I was told by M'r Gwinner, gave the chief clerk and M'r Cudlipp a certain time to leave the road and obtain other situations. Whether Cudlipp ever returned any money or not I know not. Both left the road at about the same time.

(M'r Whipple objects to so much of the answer as is hearsay.)

6. Q. At the time of this occurrence, was there any other office for the sale of tickets for the stations you have referred to than the office in which M'r Cudlipp then was, and was there any other person in said office except said Cudlipp to sell said tickets?

A. No, sir.

7. Q. For about how long a time did this overissue and sale of tickets continue to your knowledge?

A. Four months.

8. Q. Where was the office in which said Cudlipp was at that time?

A. At the foot of Courtlandt street, New York. It was known as the way-office.

9. Q. May the time when these occurrences took place, and when Cudlipp left the road, have been earlier than you thought above?

1157 A. I could not say, unless I had access to some of the books.

10. Q. May it have been as early as 1857, or in that vicinity?

A. No, sir.

And being cross-examined by M'r Whipple, he deposes and says as follows:

1. Cross-q. Please give the name of the chief clerk in the ticket department who, you say, was in league with Cudlipp.

A. I decline so doing, because he is a party whom I meet quite often now, and I don't want to hurt him in his business now—the same as I have never mentioned M'r Cudlipp's name since he left the road.

2. Cross-q. Have you the same regard for M'r Cudlipp in relation to it as you have for the chief clerk ?

A. I have.

3. Cross q. If legally summoned, will you appear in this case and state the name of the head clerk, and the part which you say he acted in this matter ?

A. If that should be the case, I should consult counsel.

4. Cross-q. Did you consult counsel before appearing here against M'r Cudlipp ?

A. No, sir.

5. Cross-q. Why not, if you regard them with equal favor ?

A. My occupation is such, that as clerk and salesman with one of the heaviest concerns in this city, David Dows & Co., that my time is required by them, and on receiving the subpœna to testify before the commissioner, I complied, but as I know nothing of the case, or nothing further than as stated under oath, I would not trespass on the time of my employers unless compelled to.

6. Cross q. To whom did you first relate, of late, what you knew about this matter of which you have testified ?

A. To M'r Sayles.

1158 7. Cross q. If you are the friend of M'r Cudlipp, why did you open this case to M'r Sayles, or tell him what you knew about it ?

A. Through M'r Jackson—F. W. Jackson. M'r Sayles came to my office and I refused to tell him anything about it at all. He came twice—I refused him both times, and told him to go to M'r Jackson and M'r Southmayd, and they would tell him the circumstances, as I did not wish to be mixed in any court matters, and have anything to say against M'r Cudlipp, or any one else. He came back the third time. I had told him that if M'r Jackson requested me to do so, I would tell him the reason of Cudlipp's leaving the road. He came back the third time and told me that M'r Jackson was not really acquainted with the facts, but thought that he was forced to resign, but could not remember the circumstances, and that Jackson said if I would not testify voluntarily, to subpœna me. I gave M'r Sayles a statement of the case. This M'r Jackson is now general superintendent of the New Jersey Railroad, as his father was before him.

8. Cross-q. Did you state the whole matter to M'r Sayles, as you have testified, before you were subpœnaed ?

A. I did.

9. Cross q. Would you have done the same in relation to the head clerk, if you had been called upon under like circumstances ?

A. Yes, sir.

10. Cross-q. How long since you have seen M'r Cudlipp ?

A. Seven or eight years—probably more.

STEPHEN W. REILLY.

Subscribed and sworn to before me this 25th day of January, 1869.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Isaac P. Wendell, recalled on the part of the complainant:

1. Q. You have heretofore testified respecting a conversation at
1159 which you were present at the Girard House between M'r Sayles,
the complainant, and J. E. Cudlipp. Will you please state in
what month and year and on what day of the month that conversation
took place.

A. It was on the 26th of August, 1867.

2. Q. At any time while M'r Sayles and Cudlipp were in company that day, did you hear M'r Sayles say anything to Cudlipp about his intention to visit Albany and Saratoga; if so, what did he say?

A. He said he expected to visit Albany and Saratoga on the Saturday following, and that he expected to be back in the early part of the next week.

3. Q. Do you know whether M'r Sayles went to Albany and Saratoga at that time; and, if so, did you see him on his return, and, if so, where?

A. He did; he left on Saturday, and I saw him at the Girard House, New York, on Tuesday evening of the next week.

4. Q. Did he then tell you anything about having seen Cudlipp; and, if so, when did he say he had seen him, and what, if anything, did he tell you that Cudlipp had said?

(M'r Whipple objects to anything that M'r Sayles told the witness.)

A. I think he said that he had seen M'r Cudlipp—I do not recollect when, and that M'r Cudlipp said that he had seen M'r Talson, and that M'r Talson had said he was going to do all he could to break the patent—something to that effect.

5. Q. Did you about the time of the Presidential election, last November, see M'r Sayles; if so where was it, and what day was it?

A. I did; first, at my office, 332 Walnut street, Philadelphia; it was on the 4th of November, next day after election.

6. Q. Did you on that day, the 4th of November, start with M'r Sayles to see any person; if so, what person?

A. I did. I started with M'r Sayles to see Asher Pancoast.

1160 7. Q. What, if anything, did M'r Sayles state to you as his
reason for wishing to see Pancoast?

(Former objection renewed.)

A. He said he thought that Pancoast was mistaken in the testimony he had given before, as instead of one brake acting from each end of the car, he thought there were two brakes, one on each end.

ISAAC P. WENDELL.

Subscribed and sworn to before me this 25th day of January, 1869.

JOSEPH GUTMAN, J'R,
Examiner, &c.

Cross-examination waived by M'r Whipple.

Adjourned to January 26th, inst., at 10 a. m.

New York, *January* 26, 1869—10 a. m.

Present, M'r Cozzens, of counsel for complainant, and the complainant in person, and M'r Whipple, of counsel for defendant.

Thomas Sayles, the complainant, recalled as a witness on his own behalf, and being examined by M'r Cozzens, he deposes and says as follows:

1. Q. Referring to the interviews heretofore testified to by you as having taken place between J. E. Cudlipp and yourself, please state when it was, giving the precise date, as nearly as you can, you first called to see said Cudlipp, and whether you then found him.

A. I called to see Cudlipp some time in August, 1867, at his house at the corner of Tenth avenue and Sixty-ninth street, N. Y., and he was not at home.

2. Q. Whom did you see when you so called?

1161 A. I saw a lady who said she was M'r's Cudlipp, who came to the door.

3. Q. Did you say anything to M'r's Cudlipp about M'r David H. Baker?

A. I asked for M'r Cudlipp; she said he was on Long Island and would not return until the next evening, or evening after, which was Saturday evening; that he would be sure to be home on Saturday evening. I told her I would call on Saturday evening. That was all that was said. M'r David H. Baker's name was not mentioned.

4. Q. M'r's Cudlipp has testified that you then told her that M'r David H. Baker sent you there, and that M'r Baker would come himself and see M'r Cudlipp on Sunday, and that you would call again on Saturday evening before the Sunday on which M'r Baker would be there. Did you say this, or anything like it, to her?

A. I did not. I only said I would call on Saturday evening myself.

5. Q. Are you able to state the precise date when the interview before testified to took place between Cudlipp and yourself at the Girard House, New York? If yea, please do so.

A. I am. It was on Monday morning, the 26th day of August, 1867.

6. Q. Did you at any time, while in company with Cudlipp on that morning, say anything to him about your intention of going to Saratoga and Albany; if so, what did you say?

A. I did. After he had called at Talson's office, on Vesey street, on that morning, as I have previously testified in this case, he said that Talson had gone to Baltimore and would not be home until Saturday of that week, and that he would call and see him on Sunday, and would call on me at the Girard House on his return from Talson's on Sunday evening, if he could see me there at that time. I told him I was going to Albany and Saratoga on Saturday of that same week, and would not return until Tuesday morning following.

(M'r Whipple objects to what the witness told Cudlipp.)

1162 He then said he would call at the Girard House on Tuesday morning.

7. Q. Did you go to Albany and Saratoga at that time, and will you state when you returned, and on what day after your return you next saw Cudlipp, if at all, and give the exact dates of these events, so far as you are able to, and state what means, if any, you have of fixing such dates?

A. I did leave New York on Saturday evening by the steamboat to Albany—on Saturday, the 31st day of August, 1867. On Sunday morning I took cars from Albany and went to Saratoga Springs. I saw George Harding at Saratoga on that day. In the afternoon of that day, Sunday, I got a team and drove out to my brother-in-law's, Jarvis Emigh's, to see my daughter, who was then stopping there. I remained there until Monday morning, and on Monday morning drove back to Saratoga and took the morning train for Troy. In the afternoon I went from Troy to Albany, and on Monday night, the 2d of September, I came by steamboat to New York, and arrived in New York on Tuesday morning, September 3d. M'r Cudlipp did not call on me at the Girard House, as he had agreed, on that Tuesday morning, and about noon of that day I went up to his house, at 10th avenue and 69th street, and saw him there. I am positive that these dates are correct from my diary; I have kept a daily diary for many years.

(Answer objected to by M'r Whipple.)

8. Q. Are there references in your diary to these events under the dates stated by you above?

A. There are.

9. Q. When were those entries made, and by whom?

A. They were made on the days referred to, by myself.

10. Q. Is that diary now present here, and is it open to the inspection of opposing counsel?

(Objected to unless the diary be put in evidence.)

1163 A. It is here, and can be inspected by the counsel.

(The diary is here annexed, it being stipulated by defendant's counsel that after this case is disposed of, it may be returned to the complainant.)

11. Q. State what Cudlipp said to you at the interview with him on September 3d.

(Objected to.)

A. He said that he saw Talson on the Sunday previous at his own house in Hudson City, and that he had a long talk with him; that Talson told him there had already been enough testimony put in the case to defeat my patent; that my patent brake was defeated sure, and that he had found testimony to show that the Tanner brake had been used on the Long Island Railroad a long time before it was invented by our party, and he also stated that he had made up his mind not to take hold of the matter and assist me in looking up testimony.

(Answer objected to.)

12. Q. You have hertofore testified in this case respecting an interview you had with M'r George W. Thompson, at Bordentown, on the 3d day of November, 1868. Did you at any time during your conversation with Thompson, at Bordentown, either on the 3d of November, or the day afterwards, or at any other time, say anything to him about wanting a "square masonic talk" with him?

A. I did not.

13. Q. Did you say anything to him about M'r Pancoast and others having their memory refreshed and altering their testimony; if so, what?

A. I did not mention M'r Pancoast's name to him. At the time I saw M'r Thompson, on the 3d and 4th of November, I had never seen or heard from M'r Pancoast after he testified here in New York in this case. I had seen M'r Yundt, who had testified for the defendants
in this case, and afterwards had changed his mind and had testi-
1164 on the part of the complainant in this case. I showed M'r
Thompson M'r Yundt's testimony in the case. I did not tell him that he had had his mind refreshed.

14. Q. Did you ask M'r Thompson to change his testimony?

A. I did not.

15. Q. Did you mention to him "half a dozen different names" as witnesses who had corrected their statements?

A. I did not.

16. Q. M'r Thompson has testified in this case that you said to him that it was very evident that some of the witnesses were mistaken, and that you did not know which side it was. Is that true; did you so say to him?

A. I showed M'r Thompson the testimony of a number of my witnesses in this case; also the testimony of a number of the witnesses on the part of the defence. After seeing this testimony and seeing how the testimony conflicted, he, M'r Thompson, made the remark that one party or the other was evidently mistaken, and he did not know which. I think I then said that there must be a mistake somewhere; both parties could not be correct.

17. Q. Thompson has testified in this case that you told him that Yundt, Pancoast, Wolcott, Crim, and Seeds had changed their testimony. Is this true; did you so tell him?

A. It is not true; I did not tell him anything of the kind. I only mentioned Yundt's name as one who had changed his testimony. Neither of the others there mentioned had changed their testimony then, and did not testify on the part of the complainant until about a week after that. I had only seen two of the parties there mentioned, which were Yundt and Crim. I did not mention Crim's name to him, for he had not yet testified. I saw Crim, and he told me what he should testify to, on the 4th day of November, after I saw M'r Thompson. I also saw Pancoast, for the first time, on the afternoon of the 4th of November, and I was advised to go and see him on that day by M'r Yundt, who had already testified in this case. After coming back from Philadelphia,
1165 I think, on the 5th or 6th of November—at any rate on the day
before M'r Wolcott testified on the part of the complainant, I saw him, Wolcott, at Hoboken, for the first time since he testified here in New York on the part of the defendants; and I did not see M'r Seeds after he testified here in New York on the part of the defendants until the evening before he testified in this case in Philadelphia, which, I think, was the 9th of November.

18. Q. You say you had not seen these men, Pancoast, Wolcott, and Seeds, when you saw Thompson. Had you heard in any way, directly or indirectly, that they would correct their testimony, or did you know anything about it, whether they would or would not?

A. I had not heard a word about their correcting their testimony, and I did not know anything at all about it until I saw them. M'r Yundt advised me to see Wolcott and Pancoast. He said he thought they ought to know what brake was on that Tyler car, and he said he thought they were honest men and would tell me just what they knew about it, and that if they had been mistaken they would say so.

(M'r Whipple objects to what Yundt said to the witness.)

19. Q. Did anybody accompany you a part of the way when you went to find Pancoast; if so, who?

A. M'r Isaac P. Wendell went down as far as the navy-yard with me, where M'r Yundt told me I should find Pancoast, and we looked about there for some time and finally ascertained that he was some two miles further south. Then M'r Wendell went back to his office, and I went down and saw Pancoast.

20. Q. Returning a moment to the witness Cudlipp, I will ask you whether in any interview with him anywhere you ever said anything to him about seeing M'r Cozzens in relation to the ten per cent. of the patent which has been heretofore referred to in this case, or anything
about M'r Cozzens being willing you should make any arrange-
1166 ment with him, or that you wanted to see M'r Cozzens before you
entered into this matter of the ten per cent., or anything in any way referring or pointing to any such subject?

A. I did not say anything to him at any time about referring the ten per cent. matter to M'r Cozzens or anybody else, or anything of the kind. One object I had in offering him the ten per cent. was to have some one to look up this testimony, so that I could spend some of my time in Chicago looking after a very important suit I had going on there in regard to a patent cultivator.

21. Q. Had you told M'r Cozzens anything about this offer of ten per cent. or ever consulted him in any way about any such thing?

A. I had not. I do not think that I ever mentioned it to M'r Cozzens until after Cudlipp testified.

Adjourned to 7 p. m. of same day.

JANUARY 26TH, 1869—7 p. m.

Present, counsel, as before, and complainant in person.

And the said complainant, Thomas Sayles, being cross-examined by M'r Whipple, did depose and say:

1. Cross-q. In answer to the 9th interrogatory, on page 361 of complainant's proof, you say, "at one of the interviews I had with him, Cudlipp, I told him that if he would take hold of the matter and help me look up the evidence, that if I succeeded in the suit I would give him ten per cent. of the net proceeds for his services." Also, in answer to the 10th interrogatory, you say, "and I told him that I supposed it was a big job, for we would have to go all over the country to look up men that had been on the Camden and Amboy road, and on the New Jersey road, between 1843 and 1850, for we had to get these facts from men who had been on these roads and knew about those brakes that had been used on those roads between 1843 and 1851." In the 1167 performance of all this service, who was to furnish money for the expense, you or Cudlipp?

(Objected to, on the ground that it is not in cross-examination of any matter inquired of upon the examination-in-chief, and the counsel is notified that in respect of all such cross-questions he makes the witness his own, and will be bound by his answers.)

Counsel for defendant says: If I mistake not, the matter of ten per cent. has been called in question in the last examination.

A. There never was anything said between Cudlipp and me as to who should pay the expenses inquired of. There had been very little said between us on that subject, for when I first spoke to Cudlipp about it, he wished to see M'r Talson to ascertain how the case stood and what the prospect was of my gaining my case.

2. Cross-q. Is it true that you offered Cudlipp ten per cent. of the nett proceeds of the patent if you succeeded, making no allusion to expenses?

A. It is true that I offered him ten per cent. of the nett proceeds of the original patent if I succeeded, provided he would do what I wished him to, and there was nothing said about the expense of looking up such testimony. There probably would have been something said if he had concluded to accept that proposition.

3. Cross-q. Was it not ten per cent. of the gross proceeds of the patent that you were to give him for these services?

A. I said it was of the nett proceeds, and it was not of the gross proceeds.

4. Cross-q. Did you suppose that a man in a good business would leave it to enter your service on ten per cent. of the nett proceeds of your patent?

A. I thought then that it would pay him well for the service he would have to render, and I think yet that it would have paid him well.

5. Cross-q. Have you read the letter filed as an exhibit in this case, written by Cudlipp to Talson, Sept. 5, 1867?

1168 A. I have read said exhibit.

6. Cross-q. So far as you are concerned in that letter, does it convey the spirit and the substance of your conversation, as therein stated ?

A. It does not.

7. Cross-q. Then do you say that Cudlipp has falsified the spirit and substance of your conversation with him ?

A. I do not say whether he has or has not; the letter shows for itself.

8. Cross-q. Has he spoken truly or written truly in that letter in reference to yourself ?

A. I do not know anything about but a very small portion of that letter.

9. Cross-q. What do you know about that portion ?

A. I know that he agreed to see me at the Girard House on Tuesday, the 3d day of September. As he states here, he was to give me an answer the next Tuesday. There was a ten per cent. also spoken of, but not in the way he has stated in this letter. I think that is all I know of the conversation between Cudlipp and myself which is stated in the letter.

10. Cross-q. Was not this letter written to Talson before Cudlipp saw him in relation to this matter ?

A. I do not know when it was written. If it was written on the day it is dated, on the 5th day of September, that was five days after M'r Cudlipp told me he saw him. I never heard of the letter until I saw it in evidence in this case.

11. Cross-q Do you think that it was written at any other time than it purports to have been written ?

A. I am sure I cannot tell when it was written.

12. Cross-q. What do you think about it ?

(Objected to.)

A. Well, sir, I do not think the letter was written or sent to Talson before Cudlipp saw him, if the date of the letter is correct, for I think
Cudlipp saw him Sunday, or the first day of September, 1867, as
1169 he told me on the 3d of September when I called on him, for I
think that at that time Cudlipp told me the truth about the
matter.

13. Cross-q. In your direct examination to day, you deny that you said to George W. Thompson, at Bordentown, that you wanted a little square masonic talk with him. Is M'r Thompson a mason ?

A. I do not know.

14. Cross-q. Are you a mason ?

A. I am a mason.

15. Cross-q. And yet you do not know whether George W. Thompson is a mason. Is that so ?

A. That is so. I never met M'r Thompson in a lodge or had any legal information of his being a mason.

16. Cross-q. James Seeds, in his evidence taken in Philadelphia for the defendant, on the 22d day of December, 1868, says, "I told M'r Sayles outside of this room that I didn't see conscientiously that I could tell anything differently from what I told in New York." Is this statement true ?

A. I never heard him say anything of the kind. He told me substantially what he did testify to, on the 10th day of November, I believe, in Philadelphia, outside of the room where his testimony was taken, and I think that he stated this to me in the presence of my counsel, M'r Cozzens.

17. Cross q. In answer to the 2d redirect question on page 375, complainant's proofs, you answer, "M'r Keller told me at the time, before the trial, that inasmuch as the trial of that brake (alluding to the Stanley-Talson brake) was a failure, that the court would hold it as an abandoned experiment." Were you present at the time the court charged the jury in this case?

A. I think I was present.

18. Cross q. Did you hear the charge of the court to the jury?

A. I think I did.

19. Cross q. How did the court charge the jury on the evidence relating to the Stanley-Talson brake?

(Objected to.)

1170 A. I do not think I could state now what that charge was.

20. Cross-q. Did he make any charge in relation to the evidence given in on that brake?

(Objected to.)

A. I think he did say something about it; I could not say what it was exactly.

21. Cross-q. Was what he did say favorable to the defendant or to the complainant?

(Objected to.)

A. I don't remember of its being unfavorable to the complainant.

22. Cross-q. Was it not favorable to the defendant, and had the jury found in accordance with the charge would not the verdict have been for the defendant?

(Objected to.)

A. I have no recollection of anything of that kind.

23. Cross-q. When the jury in that case returned their verdict of $75 damages, did they also say that the Stevens brake and the Hodge brake used by the defendants are infringements of the plaintiff's patent?

(Objected to.)

A. My recollection is that they did

24. Cross-q. Do the minutes of the trial show any such thing?

(Objected to.)

A. I do not know whether they do or not.

25. Cross-q. Did you have the minutes of the trial when you made out your bill of complaint in this case, or did you refer to them before making it out?

1171 A. We had a certified copy of some document from M'r A. A. Boyce, clerk of that court. That document stated what the verdict of the jury was, I believe.

26. Cross-q. Well, what did it say the verdict of the jury was?

(Objected to.)

A. Just what was stated in my bill of complaint.

27. Cross-q. What was stated in your bill of complaint as the verdict of the jury? To be more direct, did the jury find any other verdict than of $75 damages?

(Objected to.)

A. I don't think that jury found but one verdict in that case. I do not think they would be likely to. If you look at my bill of complaint you will there learn what the verdict was as coming from M'r Boyce, the clerk of the court.

28. Cross-q. Were not these the words of the verdict as they came from the clerk of the court, namely: "The jury here come into court, and being called answer and say that they find for the plaintiff a verdict for $75 damages." Anything more added to this verdict by the jury?

(Objected to.)

A. I recollect now positively that there was more added to that verdict.

29. Cross-q. Is there any record of such addition in the minutes as certified to by A. A. Boyce, clerk of the court?

A. I do not know about the minutes. I now recollect that some time after the trial of this case at Albany there was a hearing of the case in Buffalo—an appeal, I think—and there was something wrong about the minutes with regard to the verdict of the jury, and that Judge Hall ordered the clerk to add something to his minutes with regard to 1172 the verdict of that jury which the clerk had not got down, and I think it was that the jury found that the Hodge brake and the Stevens brake used by the defendants was an infringement of the plaintiff's patent.

30. Cross-q. Were you present in Buffalo at the time you speak of, to wit, in August, 1855, when this case came up on a bill of exceptions?

A. I was present; I cannot say as to the exact date.

31. Cross-q. And did you hear Judge Hall amend the verdict of the jury as you have stated, or, in other words, did you hear him order the clerk to amend the verdict of the jury as you have stated?

A. I do not know that any verdict was amended. I heard the judge tell the clerk to correct his minutes with regard to the verdict.

32. Cross-q. Then you use the word "correct" instead of "amend," do you?

A. You can call it whatever you like.

33. Cross-q. If I put "correct" in place of the word "amend" in the question, what will then be your answer?

A. It would not change my answer.

34. Cross-q. Then you did hear Judge Hall direct the clerk to correct the verdict of the jury, by adding that the Hodge brake and the Stevens brakes are infringements of the plaintiff's patent, did you?

A. I did not. I merely heard the judge tell the clerk to correct his minutes, so as to state just what the verdict of the jury was, as he recollected at the time, and as I recollected at the time.

35. Cross-q. Was M'r C. Daniels, counsel for defendant, present at the time?

A. I do not remember.

36. Cross-q. Do you think he was present?

A. I have no recollection about it.

37. Cross-q. Was M'r Grosvenor present?

A. I do not recollect. I should think one or both of them would have been present.

38. Cross-q. Did C. Daniels consent to this correction of the verdict of the jury, as you call it, or was it made without the consent of the defendant's counsel?

1173 A. I think I now recollect that my counsel, Samuel Blatchford, and the counsel for the defendants in that case, talked some on that subject, and I think they all agreed with the judge as to what the verdict of the jury was with regard to the Stevens and Hodge brake.

39. Cross-q. In answer to the 32d cross interrogatory, complainant's proof, page 371, speaking of the case of the United States against Joseph F. Talson, you say there has been some testimony taken on the part of the government; is it not yet closed? What progress has been made in the matter since you last testified?

(Objected to.)

A. I left this city soon after I testified in November last, and have learned since that the testimony had been closed and the case submitted, and that is all I know about it.

40. Cross-q. What testimony given by M'r Talson in this case do you understand to be the foundation of a charge against him of perjury, in contradistinction to what he had previously testified to? Please state fully.

(Objected to.)

A. That is more for the counsel in the case to say than for me, but I understand that in this case he has stated that the brake put on by him in 1842 was nearer like the Tanner brake than what he had previously testified to, and that this brake was continued on the car on which it was put; that is the prominent point, I understand.

41. Cross-q. What do you say he had previously testified to on the same matter?

(Objected to.)

A. That a brake different in some respects from the one he testified to in this case was put on a car in 1842, and used only a few days, when
it was taken off and the single treadle-brake put on in its place,
1174 and was never used thereafter while he was on the road. That is
the substance of it.

42. Cross-q. That you think a sufficient ground for the charge of perjury, do you?

A. I should think so.

43. Cross-q. Did you ever in your life make a statement to one or more persons, and then go into court and under oath contradict it?

A. I never did.

44. Cross-q. Were you ever charged in a public manner and in a public place and by an officer of the government with perjury?

A. I have no recollection of anything of the kind.

45. Cross-q. Do you remember a case being tried in the recorder's court of Cook County, in the State of Illinois, in October, 1863, entitled "The People ag'st Nehemiah Hodge," charged with an assault with intent to kill?

(Objected to.)

A. I recollect such a suit.

46. Cross-q. Were you a witness for the defendant in that case or suit?

(Objected to.)

A. I was.

47. Cross-q. When Joseph Knox made the closing argument for the people, did he not publicly charge you, in the court-house, with perjury?

A. I am not aware that he did.

48. Cross-q. Did he not turn to you, sitting within the bar, and say to you, "I charge you, Thomas Sayles, with perjury. My name is Joseph Knox. I live in such a street, at such a number, in Chicago. You ought to be arrested and held to answer before you leave the city"? Answer truly, upon your oath, if he did not make this charge, in the presence of many witnesses, in the concluding argument for the people against the
said Nehemiah Hodge?
1175 A. He made no such charge in my presence, and I think I was
there during his argument, or a portion of it, at any rate.

49. Cross-q. Do you stand by that answer?

A. That is my answer.

50. Cross-q. Is it a true answer, so help you God?

A. I have answered the question according to my recollection of the facts in the case.

51. Cross-q. Is your answer yea or nay ?

A. I have answered the question.

52. Cross-q. Truly, so help you God ?

A. You have my answer.

And being re-examined by M'r Cozzens, he says as follows:

1. Redirect q. Since this matter has been gone into upon the other side, please state what was the offence charged in that case, and upon whose complaint the proceedings were instituted.

A. I understood at the time (objected to as to what the witness understood) that one Stephen M. Whipple, of North Adams, Massachusetts, complained of Nehemiah Hodge, of the same place, for making an infernal machine, and sending it to Chicago, Illinois, directed to said Whipple, and it was proved on that trial that such a machine had been sent to said Whipple at Chicago. Hodge was charged with making the machine and sending it, and this trial was on that charge. The trial resulted in M'r Hodge being found not guilty. He was discharged.

2. Redirect q. Was this S. M. Whipple the counsel who has been cross-examining you ?

A. The same.

3. Redirect q. If you have any further statements which you may wish to make in this connection, please make them here.

A. This M'r Whipple was also a witness in that Hodge infernal-machine case against M'r Hodge, and it was stated after that trial 1176 was over and Hodge discharged that if M'r Whipple had been on trial instead of Hodge he would not have come off as well as Hodge did. This was stated by some of the jurymen on that case. M'r Knox, in summing up that case, did talk pretty strong about my evidence, as my evidence did not agree with M'r Whipple's, but he did not in my presence make the statements mentioned in M'r Whipple's question to me.

THOMAS SAYLES.

Testimony on the part of complainant, taken at Philadelphia, January 29th, 1869.

Present, the complainant, in person, and S. M. Whipple, esq., counsel for defendant.

Asher Pancoast, recalled, deposes as follows:

1. Question. Edwin Lockwood has testified in this case that after you were first examined in this matter, in New York, you were employed by him on the Camden & Amboy R. R., and that through neglect and dissipation he discharged you. Is this statement in regard to his discharging you true ?

Answer. It is not true.

2. Question. Please state the circumstances of your going into the employ of the Camden & Amboy R. R. Company, and why you left it.

Answer. I went into the employ of the company under the expectation of getting an engine to run. M'r Lockwood held out inducements that he would use his influence towards helping me to get a situation as engineer, which he did not. He kept me working under the cars, and I got tired. I told his foreman that I would quit. He then said I had better not quit till I got something else to do. I told him if I had to do that kind of work I would do it for some other company. I then 1177 started to New York, hunting for a situation. I was gone two days. I came back, and goes to M'r Reybow. I told him I supposed he had another man in my place. He said no, so I went to work and worked about a week or ten days. My money come down. I then goes home and told my wife I wouldn't work any more. I didn't say anything to M'r Reybow about it at all.

3. Question. Then you left of your own accord, did you?

Answer. I left of my own accord.

4. Question. During this time that you so worked for the Camden & Amboy R. R. Company, did you spend any time in dissipation, or were you off on any drunken spree?

Answer. No, sir. I was off duty sick with neuralgia in the face, four or five days.

5. Question. At the time of your applying for the situation on the Camden & Amboy R. R., did you say anything to Lockwood about a man by the name of Wood using his influence to get you discharged from your previous situation?

Answer. No, sir; I had no occasion to. I did not know of his using any such influence, and he did not use any such influence.

6. Question. Is your regular business running a locomotive engine?

Answer. Yes, sir.

7. Question. About what are the average wages of a locomotive engineer?

Answer. About eighty dollars a month. I get more than that now.

8. Question. You say you got tired of the work Lockwood kept you at under the cars. What wages did you receive for that work?

Answer. A dollar and eighty-seven and a half cents a day.

9. Question. Did George W. Thompson, a witness in this case, have a conversation with you last December in Philadelphia, by Graham's Hotel?

1178 Answer. Yes, sir.

10. Question. Please state fully what that conversation was, as nearly as you can remember it.

Answer. Well, I met him in the door of the hotel. He says, "Pancoast, how are you? I am glad to see you. You are the man I have been looking for all day; I have been over to your house. What I was going to say," he said, "is about that brake. You have put myself and M'r Lockwood in a bad fix." I says, "Thompson, I don't know what kind of a fix you are in, but I know I was mistaken when I come to talk to my old men I had railroaded with." "Oh, I suppose," he says, "M'r Sayles has paid you, or promised you, like he has some of the rest, twenty per cent. of the patent." I says, "M'r Sayles has never promised me a cent, but I suppose every man has his price." He then went on to tell about his doing business for the company—about his fixing up the Tyler car. He then made use of language towards M'r Sayles which wasn't very becoming. I don't remember what he said. I told him that M'r Sayles had always used me like a gentleman. I then said I had never spoken to M'r Sayles more than twice or three times in my life. "Oh," he says, "it makes no difference about that. You had better go back to the company; you were brought up there." "Well," I says, "I don't care anything about the company or anybody else. I want every man to have his rights."

11. Question. Did he say anything to you about making your testimony like what you stated in New York; if so, what did he say?

Answer. Yes; he asked me if I couldn't rectify that. I told him, no; I was satisfied what I said last was right. He said if I was not going to make any corrections he had no more to say.

12. Question. Did you tell him that ten or twenty thousand dollars

from either party would make you tell a great deal, or anything to that effect?

Answer. No, sir; such language was not used at all.

13. Question. Did you tell him that the company had not used you right by discharging you, and that you were going to have your price if you could get it?

1179 Answer. No, sir; there was no such language used at all between me and M'r Thompson.

14. Question. You say you told Thompson you knew you were mistaken when you came to talk with the men you had railroaded with. What did you mean you were mistaken about?

Answer. I meant I was mistaken about the brake; about its being connected.

15. Question. Do you mean about the testimony regarding the brake which you gave in New York?

Answer. Yes, sir.

16. Question. How long have you known this witness, Thompson?

Answer. I have been acquainted with him ever since 1837 or 1838.

17. Question. Do you know about when he commenced to do work for the Camden and Amboy R. R. Company?

Answer. As near as I can tell, about 1848. He had a little shop in 1846.

18. Question. Was he doing any work for them in 1843?

Answer. No, sir; I don't think he was. He might have done a little work. I don't think he had any shop then at all. He had a shop in 1848.

19. Question. Will you please state, as fully as you can remember, all the conversation which took place between you and M'r Reybow at the time he first came to you to procure you to testify in this case?

Answer. He came and asked me about the brake, and I told him I didn't recollect exactly, but would see how it was. So we talked it over, and we rather brought it to our minds that it was a double brake; and I rather thought it was a double brake.

20. Question. Did he say anything about why the railroad company were trying to procure evidence in this suit; if so, what?

Answer. M'r Reybow never said anything to me about it.

1180 21. Question. Did the witness Lockwood ever say anything to you about this Sayles suit being an important one to the railroad company, or anything about why they were procuring testimony in it; if so, what did he say?

Answer. M'r Lockwood and me got in conversation about this brake. I says to M'r Lockwood, I don't see why the company should take such interest in it. I understood M'r Van Rensselaer had paid M'r Sayles for his right. M'r Lockwood said that he had been blackmailing several companies, and they were going to try to work it out now.

22. Question. When and where did this conversation take place?

Answer. In the car, between Bordentown and Trenton. It was just before I testified in New York.

23. Question. Did Lockwood say anything to you then about wanting your testimony in the case?

Answer. Yes; he said something about it at that time. There was some other gentleman came up and began to talk to him and throwed us out.

24. Question. You say Lockwood said they were "going to try to work it out." Work what out?

Answer. The brake. He was talking about the brake, and he said they were going to work him (M'r Sayles) out.

(Objected to.)

25. Question. State, if you remember, what day it was that M'r Sayles talked with you for the first time after you were examined in New York, and shortly before you corrected your testimony in Philadelphia.

Answer. It was the forepart of November last; the day after election.

Cross-examination waived by defendant.

ASHER PANCOAST.

Sworn to and subscribed before me this 29th day of January, 1869.

W. GRIER HIBLER,
U. S. Commissioner.

1181 Continued from 29th inst.

Present, complainant in person; S. M. Whipple, esq., for respondents.

Elizabeth Pancoast, being duly sworn, says:

1. Question. What is your name, age, and residence?

Answer. Elizabeth Pancoast; aged fifty years, and reside at Camden, New Jersey.

2. Question. Are you the wife of Asher Pancoast; if so, how long have you been his wife?

Answer. I am, and have been for thirty years.

3. Question. Do you remember your husband's working for the Camden and Amboy Railroad Company in the fall of 1867?

Answer. Yes, sir.

4. Question. About how long was he in their employ at that time?

Answer. I should suppose two or three months.

5. Question. Do you know what kind of work he was doing at that time; if so, what?

Answer. Something of repairing cars.

6. Question. Had he worked for that company before; if so, in what capacity and about how long?

Answer. He has, in the capacity of brakeman, fireman, and engineer. I should suppose as engineer about 14 years. It is twenty-six years since he commenced working for them. I think I am mistaken—it is longer than that; it is 28 years.

7. Question. During the two or three months you say he was at work for the company in 1867 was he off duty on a drunken spree, and has he been in the habit of being on such sprees during the last 30 years? Please state fully.

Answer. During the two or three months he was off hunting for a situation once or twice. He was not on a drunken spree. He has not been in the habit of going on such drunken sprees in the last 30 years. I have seen him under the influence of liquor, I distinctly remember, but three times during the last 30 years. I can recollect the
1182 first very well—it was when James K. Polk was elected President. He was so that he came home himself, and was a little jolly, and was afterwards very sick. The others I can't recollect; they were within the last six years. But he was never so drunk but what he could walk home and take his supper, and attend to any business had it been business hours.

8. Question. Have you ever known him to neglect his business from the influence of liquor?

Answer. Not from the influence of liquor; no, sir.

9. Question. Is your husband a member of any church; if so, what church, and how long has he been a member?

Answer. Yes, sir; the Methodist Episcopal Church in Camden, and has been about 14 years. I am a member of the same church.

10. Question. Do you know why your husband left the employ of the Camden and Amboy R. R. Co. in 1867; if so, please state?

Answer. He was dissatisfied with his situation. When he accepted this situation he took it for a short time. He expected to be made an engineer; that is what he told me at the time he took it. He complained very much at not getting the situation that was promised him. He said he would not work for them in the position in which he was; if he done such work he would do it for some one else, but he would not do it for the Camden and Amboy R. R. Co., as he felt too much humiliated.

11. Question. During the two or three months that he was in the employ of that company, in 1867, how often was he at home?

Answer. He spent his evenings home, and was home to his meals, as we lived very near where his work was. It has been his habit for the last 30 years, at home. It is very seldom he goes out evenings.

12. Question. During the whole 30 years that you have lived with him, about how many evenings, as near as you can recollect, has he spent away from home when not absent on business?

1183 Answer. I can't say how many; it is a good many years to recollect. Unless on business, it wouldn't average a dozen evenings a year, or, I am sure, the half of that.

13. Question. During the two or three months he was in the employ of the Camden and Amboy Company in 1867, was he home sick; if so, about how long?

Answer. He was at home sick, I think, about a week, with neuralgia or erysipelas.

14. Question. Could he have been off on a spree during that time and you not have known it?

Answer. I think not, as his business was close at home. He was gone to New York to look for employment two or three days during that time.

15. Question. You have said that you saw your husband under the influence of liquor distinctly three times; are those the only times when you ever saw him under the influence of liquor?

Answer. The only times that I can say that he was ever under the influence of liquor.

Cross-examination declined.

ELIZABETH PANCOAST.

Sworn to and subscribed before me this 30th day of January, 1869.

W. GRIER HIBLER,
U. S. Commissioner.

N. Y., FEBRUARY 3, 1869—2 p. m.

Present, M'r Sayles, complainant, in person, and M'r Whipple, of counsel for defendant, and M'r Cozzens, of counsel for complainant.

JOSEPH HERBERT, a witness recalled by complainant, deposes and says as follows:

1. Q. Have you been examined as a witness in this case?
A. Yes.

1184 2. Q. You stated in your former testimony that you had something to do with the excursion trains run on the Camden and Amboy Railroad between the year 1843 and the time you left the road. How many seasons were those excursion trains run before you left that company?

A. About two, I guess, as near as I can tell.

3. Q. What year was it that you left that company?

A. I cannot recollect, hardly; but I think in about the year 1845; I guess it was 1845, that is, when I left the cars.

4. Q. Were you ever discharged from the employ of the Camden and Amboy Railroad for taking things from the cars, or for any other reason?

A. No, sir; I never was discharged from the road in my life.

5. Q. Do you know Edwin Lockwood, superintendent of car repairs on said railroad?

A. Yes, sir.

6. Q. Edwin Lockwood has testified in this case that you were discharged from said road for taking things from the cars belonging to the passengers, and that he reported you to Captain Shippen, who discharged you for it; is that true?

A. No, sir; I deny that.

7. Q. Did you, while in the employ of said company, and while you were engaged about the cars, have any difficulty with Edwin Lockwood? And, if so, please state fully all the circumstances of the matter.

A. When I went on to the excursion trains, Captain Shippen always gave me the right of the whole control over the line; getting the cars ready, that is what I call the control; and he used to tell me whenever the cars reached each end to go through the cars and not to allow any one else to go through until I went through myself, and if I found anything in the cars to keep it until the owner called for it, and if the owner did not call for it it became mine. I was going over to Amboy, and after I got to Amboy I went through the cars and found a green veil, which had three or four holes in it, and the engineer went through
1185 the cars. I had hung it on the side of the car; the engineer took
it down and wore it on his hat for some time around the wharf. I hung it there for the purpose that whoever lost it might see it and get it; the engineer brought it back and hung it up on the same place. When we went back to Bordentown, I went through the cars and picked up the veil, which had fallen down. Lockwood was standing in the door when I picked the veil up, and wanted to know what that was. I said it was none of his business. He said the owner wanted it, and the boat had pushed off; he had not been on board the boat at all. He came back to the car again, and said the owner wanted it. I threw it to him, and it fell on the car floor. I told him "take it home to your wife." He turned around and said, "If you will take one thing, you will take another." With that I put after him, and he started for home. When I got home myself I took my supper, and the more I thought of it the less I liked it. I have lived in Bordentown 59 years and had never been accused of stealing before. So the next morning I went down to the wharf to see Captain Shippen. As I was going through to the office I met Lockwood at the door; said I, "Lockwood, what was that you said to me last night?" He said, "Nothing." Says I, "You did; you said if I took one thing I would take another." I don't know whether he answered yes or no, but I answered, "I have a good mind to knock you clean through that door." Captain Shippen was up in his office. Lockwood walked out and got a club and came in with it. Says

I, "Lockwood, I don't fear your club at all." And while we were talking Captain Shippen slipped around by him. Lockwood didn't see him; he started for the captain's office and then came back again. By that time Captain Shippen got back to his office again, and I went after him. I told Lockwood he could not get me discharged anyhow. He had threatened to get me discharged. I followed Captain Shippen to his office, and he said, "Joe, what is the matter?" And I said, "Lockwood has been adjudging me of stealing." "O, don't you mind
Lockwood," said he—just so; "You go back to the car-house
1186 and attend to your cars." Said I, "Captain, I'm not going to do
it; I'm going to quit," I said, "I want my money." He said, "Go over to your cars." He said, "I won't pay you; you go over to your cars." I said, "I won't do it, I am going home." Just as I was going out of the door, he said, "Come down to-morrow and I'll give you your money, but go over and attend to your cars." These were the last words he said to me as I was going down stairs. On the next day I went down to his office for the money. Lockwood had followed me over with a club, as I was going home through the car-house, the day before. The captain tried to coax me to take my turn again on the cars, but I refused to go, and left.

8. Q. After you left the cars at this time, how long did you remain off the road?

A. Not quite two months, and then Captain Shippen sent to me to come and saw wood under the shed, with a buzz-saw, and I remained there about two years.

9. Q. Did you leave the company at the end of this two years; and if so, why?

A. I did, on account of my eyes; the dust got into my eyes and made them sore. I then went on to a farm.

10. Q. About how many years have you been engaged in your present employment on the Camden & Amboy road?

A. Three years this coming spring.

11. Q. Lockwood has testified that the thing which he says you took out of the cars was a large shawl. Is this true?

A. No; I never found a shawl in the cars in my life.

12. Q. Are you acquainted with Asher Pancoast, who has been employed on the Camden & Amboy Railroad?

A. Yes.

13. Q. How long and about how intimately have you known him?

A. I guess about twenty years ago; he is a little related to my mother; he used to run on the road there; we spoke to each other when we met;
we met quite often.
1187 14. Q. Since you have been acquainted with him, have you
known him to be a drinking man, or apt to go on sprees?

A. No, sir; I always saw him conducting himself upright, carrying himself straight. I never saw him on a spree.

And being cross-examined by M'r Whipple, he deposes and says as follows:

1. Cross-q. Did M'r Lockwood, at the time this matter happened of which you have spoken, have charge of the car department of the Camden & Amboy road, the same as he now has?

A. Yes.

JOSEPH HERBERT.

Subscribed and sworn to before me this 3d day of February, 1869.

JOSEPH GUTMAN, J'r,
Examiner, &c.

1188 In the circuit court of the United States, for the northern district of Illinois.

THOMAS SAYLES *vs.* THE CHICAGO AND NORTHWESTERN RAILROAD Company.	In equity.

Depositions of witnesses on behalf of complainant, taken before William Grier Hibler, United States commissioner and examiner, at his office, No. 435 Library street, Philadelphia, on the sixth day of March, A. D. 1869. M'r S. D. Cozzens attending on behalf of complainant, and M'r S. M. Whipple on behalf of respondents.

Charles Yundt, being recalled, testifies as follows:

1. Question. Did you, on Monday, the 22d of February, 1869, see Thomas Sayles, the complainant in this case, in Philadelphia, and did he read to you questions 11, 12, and 13, on page 308 of the printed record in this case, containing complainant's new proofs, and which questions and answers I now show you, and did he ask you if those answers given by you to those questions were true, and did you say to him that they were true?

(Objected to by M'r Whipple.)

1189 Answer. He didn't read nothing to me. He asked me if those questions and answers were right. I said yes. I said to him the Tyler car had double brakes in 1843, but not connected together; I meant brakes at each end of the car. That was what I said all the time. I say that in 1845 and 1846, to the best of my knowledge, they was connected brakes.

2. Question. Did you say to M'r Sayles at this time that what you testified to in this case in October, 1868, was true, and that the double connecting brake was first put on the old Tyler car about the time the McLaughlin brake was first put on the Camden and Amboy road?

Answer. I don't remember what I said to M'r Sayles; he never asked me a word about the brakes the other day when he met me. He only took a drink and walked right off. He only asked me those three answers 11, 12, and 13, which you showed me, and he asked me if those were true, and I said yes, and that was all there was about it; there were two gentlemen with him.

3. Question. Did you tell him at this time that George Thompson, of Bordentown, was here to see you before you testified in this case last December, and told you that what you had testified to made him (Thompson) and Lockwood liars?

Answer. I did tell him so.

4. Question. Were the two gentlemen who were present with M'r Sayles at that time, the two gentlemen, M'r Wendell and M'r Hubbard, who are now present?

Answer. M'r Wendell was present; I don't remember M'r Hubbard

Cross-examined:

1. Cross-question. Is what you first testified to in New York about this brake true?

(Objected to.)

1190 Answer. It is, to the best of my knowledge.

Redirect:

5. Question. Do you still say that the answers 11, 12, and 13, which have been referred to, are true?

Answer. They are, to the best of my knowledge.

Recross:

2. Cross-question. Is it true that there was a connected double-acting brake in use on the Camden and Amboy road in 1845?

(Objected to.)

Answer. I can't say the year; it was in 1845, to the best of my knowledge.

Redirect:

6. Question. In what year was the McLaughlin brake first put on the Camden and Amboy road?

Answer. I can't say; from 1848 to 1851. I can find out exactly by looking at the books at Bordentown.

7. Question. You have stated here to-day, though it does not appear upon the record, that the first connected double brake on the Tyler car was put on before the McLaughlin brake was used on the Camden and Amboy road. How long before was it?

Answer. I can't tell exactly. They were some time getting the McLaughlin brake on, and after they had had that on a while they put it off, and then they put on all the passenger-cars a brake like the one on the Tyler car.

3. Cross-question. Was the brake on the Tyler car a double-acting brake?

Answer. It was.

1191 4. Cross-question. And was this brake on the Tyler car in 1845 or 1846?

(Objected to.)

Answer. Yes, sir; to the best of my knowledge.

5. Cross-question. Did this brake operate on both trucks at the same time?

(Objected to.)

Answer. I think it did, to the best of my knowledge.

CHARLES YUNDT.

Subscribed to before me this 6th day of March, 1869.

W. GRIER HIBLER,
United States Commissioner.

Isaac P. Wendell, being duly affirmed, testifies as follows:

1. Question. Were you present with Thomas Sayles, the complainant in this case, at an interview in Philadelphia on the twenty-second day of February last, between him and Charles Yundt, the witness who has just testified?

Answer. I was.

2. Question. Who else was present there?

Answer. Mark C. Hubbard, the gentleman who is now here.

3. Question. Did M'r Sayles at that interview read any questions and answers to Yundt from the printed record in this case; and if so, what questions, and what did Yundt say to M'r Sayles in your hearing at that interview?

Answer. He did. He read the 11th, 12th, and 13th questions and answers. M'r Yundt replied, "That is right;" "That is true;" "That is what I testified to." He afterwards said that the double-connecting brake was put on the Camden and Amboy road about the time the McLaughlin brake was put on the road. He said, I think, that the first double-acting brake that was put on the Tyler car was 1192 put on about this time. He said that the brake put on the Tyler car in 1843 was not a connecting brake, but a brake on each end of the car, and that it was called a double brake, but that it was not connected. He said that M'r Thompson called to see him, and had told him that the testimony he had given was going to make him and Lockwood liars. That was the substance of what he said. That he asked Thompson what he knew about it; that he, Thompson, was only a boy when this took place.

(All of the answer objected to by M'r Whipple.)

Cross-examined by M'r Whipple:

1. Cross-question. How did it happen that you were present at this interview between Sayles and Yundt?

Answer. M'r Sayles asked me to go with him to find the place where Yundt was.

2. Cross-question. Did M'r Sayles tell you he did not know where to find Yundt?

Answer. No.

3. Cross-question. Had you any other object in view than to show M'r Sayles where M'r Yundt was?

Answer. Yes. M'r Sayles requested me to be present at the interview.

4. Cross question. Why did he wish you to be present at the interview after you had shown him where Yundt could be seen?

Answer. He simply requested me to be present—that he would like me to be present.

1193 5. Cross-question. Did you thereafter expect to be called as a witness as to what was said at the interview?

Answer. He said that I might be called; he did not think I would, but that I might be called.

6. Cross-question. How many times have you been called to testify in this case of conversations or interviews at which you were present at the request of M'r Sayles?

Answer. This is the third time I have been called, but I have testified in reference to interviews of only two persons, Cudlipp and Yundt.

7. Cross-question. Haven't you testified in reference to two interviews at different times between Sayles and Cudlipp?

Answer. No.

ISAAC P. WENDELL.

Affirmed to and subscribed before me this 6th day of March, A. D. 1869.

W. GRIER HIBLER,
U. S. Commissioner.

MARK C. HUBBARD, being duly affirmed, testifies as follows:

1. Question. Were you present at an interview in Philadelphia on the 22d February last, between the complainant Sayles and Charles Yundt, the witness who has testified here to-day?

Answer. I was.

2. Question. Who else was present at the interview?

Answer. M'r Wendell.

3. Question. Did M'r Sayles read anything to Yundt at that interview; if so, what, and what did Yundt say to M'r Sayles? Answer fully.

Answer. M'r Sayles read to him, from a printed circular or pamphlet,
questions and answers numbered 11, 12, and 13, and M'r Yundt
1194 replied, "That is just what I swore to." M'r Sayles then asked
M'r Yundt if what he swore to at that time was true. M'r Yundt

replied, "Of course it was true, or I should not have sworn to it." Then M'r Sayles asked him in regard to the time when this double-connecting brake was put on the cars, or his brake, as he called it. M'r Yundt replied that it was put on the Tyler car about the time the McLaughlin brake was put on the Camden and Amboy road. Then there was some conversation in relation to M'r Thompson, and M'r Yundt replied that Thompson was there to see him, and said that what he (Yundt) swore to last made him and Lockwood liars. Yundt said that he said to Thompson, "What in hell do you know about it? You was nothing but a boy then, anyway." M'r Sayles then asked him in regard to the brake that was on the cars then that they called a double brake, and Yundt said they certainly did have what they called a double brake, but it was one that broke from each end of the car, and had no connection (this time they were speaking of was 1843). He also said that was the only double brake that they ever had on the road before the McLaughlin brake. M'r Yundt reiterated several times during the interview that what he swore to in October was true.

Cross-examined by M'r Whipple:

1. Cross-question. How happened you to be present at this interview?

Answer. At the request of M'r Sayles.

2. Cross-question. Did he inform you that he would call you as a witness as to what was said at the interview?

Answer. He said that he might and he might not, but hardly thought that they would examine M'r Yundt again.

MARK C. HUBBARD.

Affirmed to and subscribed before me this 6th day of March, A. D. 1869.

W. GRIER HIBLER,
U. S. Commissioner.

1195 Counsel for complainant puts in evidence duly authenticated copies of the clerk's minutes of trial in the case of Henry Tanner vs. The New York and Erie Railroad Company, tried in October, 1854, and the case of Nehemiah Hodge vs. The New York Central Railroad Company, tried in 1859, and they are marked respectively, "Complainant's Exhibit 2, New Proofs," and "Complainant's Exhibit 3, New Proofs."

At a stated term of the circuit court of the United States of America, for the northern district of New York, in the second circuit, held at the city hall, in the city of Albany, on Tuesday the 24th day of October, in the year of our Lord one thousand eight hundred and fifty-four.

Present, the honorable Nathan K. Hall, judge; M'r C. M. Keller & S. Blatchford appear as plaintiff's counsel; M'r C. Daniels & T. P. Grosvenor appear as defendant's counsel.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD Company. }

Ordered:

On motion M'r S. Blatchford, of counsel for plaintiffs, that a 1196 jury be empannelled and that the trial of this cause do now proceed. Whereupon the following-named jurors were duly called and sworn, viz: John Artcher, Peter Marker, Abram Buzzer, William Boardman, David McCarty, Henry Rector, Garrett Warren, Patrick Cullen, Henry Swan, Alfred Southwick, William P. Davis, John M. Bussing.

The four last named jurors are talismen here summoned and returned by marshal, as per order of court now entered.

Plaintiff's counsel opens and reads documentary evidence.

Plaintiff's witnesses, Harvey Waters, James J. Mapes.

Court here took a recess to 3½ p. m.

3½ P. M.

Court met. Present, Judge Hall.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY. } Trial continued.

Plaintiff's witnesses: Mapes, ex'd; John Clark. Plaintiffs rest. Damages stp'd at $75.

M'r Daniels here opens for the defence. Defendants read documentary evidence and depositions.

Defendant's witnesses: Henry Gray, Samuel E. Dennis, Joseph F. Talson, Moses Parsells, Bernard Hughes, Frederick Boyce, Nehemiah Hodge.

Court adjourned to 9 o'clock to-morrow morning.

1197 WEDNESDAY, *October* 25*th*—9 a. m.

Court met. Present, Judge Hall.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY. } Trial continued.

Defendant's witnesses: Dennis, re-ex'd; Wilson Eddy, Sarah A. Nicholas, Ferdinand Le Pennes. Defendants rest. Plaintiffs reads depositions.

Plaintiff's witnesses: Lafayette Thompson, Asahel G. Bachelder. Waters re-ex'd.

Court here took a recess to 3½ p. m.

3½ P. M.

Court met. Present, Judge Hall.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY. } Trial continued.

Plaintiff's witnesses: Mapes, re-ex'd. Depositions read.

1198 Defendant's witnesses: Hodge, re-ex'd.
Testimony here closed.

M'r Daniels then summed up for the defendants.

Court adjourned to 9 o'clock to-morrow morning.

THURSDAY, *October 26th*—9 o'clock a. m.

Court met. Present, Judge Hall.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY. } Trial continued.

M'r Kellar summed up for plaintiff.

Judge Hall here charged the jury. Bailiff sworn and jury retire to consider verdict. (1 more bailiff sworn.)

Court took a recess to 3½ p. m.

3½ P. M.

Court met. Present, Judge Hall.

HENRY TANNER
vs.
THE NEW YORK AND ERIE RAILROAD COMPANY. }

Ordered: Marshal furnish jury out in this case with refreshments.

1199 The jury here came into court, and being called, answer and say that they find for the plaintiff a verdict of seventy-five dollars,* and that the Stevens brake and the Hodge brake used by the defendants are infringements of the plaintiff's patent.*

(*Amendment to verdict added on motion of S. Blatchford for plaintiff, C. Daniels, for defendants, consenting thereto.)

Ordered, on motion of defendant's counsel, that jury be polled. Whereupon each juror answers and says "This is my verdict."

On motion of M'r Farrington, defendant's counsel, that defendants have 40 days within which to make a case, or bill of exceptions or both, and that in the meantime all proceedings on the verdict be stayed, Ordered, that the plaintiff have also 40 days within which to serve amendments after service of a copy of said bill or case or both.

UNITED STATES CIRCUIT COURT,
Northern District of N. Y., ss:

I, Augustus A. Boyce, clerk of said court, do hereby certify the preceding to be a true and correct copy of the minutes as entered in the book of minutes of this court, in a case where Henry Tanner is plaintiff, and the New York and Erie Railroad Company is defendant.

In witness whereof, I have hereunto subscribed my name and have hereunto affixed the seal of the said court, at my office, in the city of Utica, in the said district, this 20th day of February, A. D. 1869.

[L. S.] A. A. BOYCE, *Clerk.*

At a stated term of the circuit court of the United States of
1200 America, for the northern district of New York, in the second
circuit, held at the village of Canandaigua, on Thursday, the 30th day of June, in the year of our Lord one thousand eight hundred and fifty-nine.

Present, the honorable Nathan K. Hall, judge. Mess'rs Keller and Seymour appear for pl'ff. Mess'rs Gifford & Davis appear for def't.

NEHEMIAH HODGE
vs.
THE NEW YORK CENTRAL RAILROAD
Company. }

On motion of M'r D. L. Seymour, pliff's att'y, ordered that a jury be empannelled, and that the trial of this cause do now proceed. Whereupon the following named jurors were duly drawn, called, and sworn, viz: Cyrus Woodruff, Henry A. Metcalf, Andrew J. Hanna, Franklin Beebe, Elisha M. Bradley, Isaac Stoutenburg, James Beattie, Morgan Doty, Seth Gates, George Mathew, Benj. D. Eckler, Charles L. Curtis.

M'r Keller opens the case for plaintiff.

Witnesses for plaintiff: Nehemiah Hodge, David Upton, George Page.

Recess to 2 o'clock p. m.

2 O'CLOCK P. M.

Court met. Present, Judge Hall.

THE SAME
vs. } Trial continued.
THE SAME.

Plaintiff's witnesses: Page (re-ex'd), Henry Waters, Samuel Cooper.

1201 M'r Davis here opens for the defence.
Defendant's counsel reads depositions.

Defendant's witness: Wilson Eddy.

Court took recess to 7½ p. m.

7½ P. M.

Court met. Present, Judge Hall.

THE SAME
vs. } Trial continued.
THE SAME.

Defendant's witnesses: Benjamin F. Smith, Henry Waterman, Eddy (re-ex'd), Hadley P. Fairfield, Nathan Randall.

Court adjourned to 8 o'clock 5 minutes to-morrow morning.

FRIDAY, *July* 1*st*—8 o'clock 5 minutes a. m.

Court met. Present, Judge Hall.

NEHEMIAH HODGE
vs. } Trial continued.
THE NEW YORK CENTRAL RAILROAD
Company.

Defendant's : Page (re-ex'd).
Plaintiff reads depositions.
Hodge and Waters (re-ex'd).
M'r Gifford here sums up for the defendants.
M'r Keller then sums up for plaintiff.
Court here takes recess to 2 o'clock p. m.

1202 2 O'CLOCK P. M.

Court met. Present, Judge Hall.

NEHEMIAH HODGE
vs. } Trial continued.
THE NEW YORK CENTRAL RAILROAD COMPANY.

M'r Keller concludes the summing up for plaintiff.

Judge Hall charges jury; bailiff sworn, and jury retire. Afterwards jury come in and, being called, answer and say they find a verdict in favor of plaintiff for $1,500, damages.

Ordered, defendants have 60 days to make a case, or bill of exceptions, or both, and in the meanwhile the plaintiff's proceedings be stayed.

UNITED STATES CIRCUIT COURT,
Northern District of New York, ss :

I, Augustus A. Boyce, clerk of the said court, do hereby certify that the preceding is a true and correct copy of the minutes of trial in the cause named in the beginning thereof, as entered in the book of minutes of this court.

In witness whereof I have hereunto subscribed my name and have hereunto affixed the seal of said court at my office in Utica, in said district, this 3d day of June, A. D. 1868.

[L. S.] AUG'S A. BOYCE, *Clerk.*

1202½ THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company. } In chancery.

Exhibit No. 7 in Supreme Court record.

W'M. H. BRADLEY, *Clerk.*

1203 *Rebutting testimony on behalf of the complainant.*

Testimony taken at Providence, Rhode Island, in the circuit court of the United States for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILWAY Company. } In equity.

Examination of witnesses on behalf of the complainant before Francis A. Daniels, commissioner of the circuit court of the United States for the district of Rhode Island, at his office, No. 29 Weybosset street, in the city of Providence, in said district, on the tenth day of September, A. D. 1872.

1204 Olney L. Smith, of Providence, in said district, having been duly sworn according to law, testifies and says as follows :

Direct examination by M'r Cozzens :

Int. 1. Are you the same Olney L. Smith who was examined in this case for the defence on the fifth of August, 1872, at Springfield, Massachusetts ?

Ans. Yes.

Int. 2. Will you please state whether you have recently made any test upon the Providence and Worcester railroad of the brake known in this case as the Springfield brake; and, if so, please state when you made such test.

Ans. I have. I made the test a few days since—one day last week.

Int. 3. Will you please look at the drawing now shown you, and state what that drawing represents ?

Ans. This drawing represents the Springfield brake as we put it on last week, on a platform-car, No. 1504 or 1505, weighing, I should judge, seven to eight tons.

Int. 4. Then, as I understand it, the truck at the right hand of the figure had two chains?

Ans. Yes, sir.

Int. 5. And the truck at the left hand of the figure had one chain?

Ans. Yes, sir.

(The drawing referred to is put in evidence, and marked "Complainant's Accounting Exhibit Second Providence and Worcester Springfield Brake, F. A. D.")

Int. 6. Please state about what was the length of the body of this car upon which this test was made one day last week?

1205 Ans. About thirty feet long. I didn't measure the car body. We build these cars, and calculate to make them thirty feet over all.

Int. 7. Please state what was the length of the short chain—from the centre of the windlass-staff to the centre of the hole in the top of the truck-lever—in the case of right-hand truck you have mentioned?

Ans. The short chain was 19½ inches.

Int. 8. The truck-levers were on the outsides of the brake-bars, as in this exhibit, were they?

Ans. Yes, sir.

Int. 9. Will you please state what was the test to which you put that car?

Ans. We put the car on a straight track—or where the track was straight—and set the brakes as hard as an ordinary man could set them, and coupled on a locomotive to the car and pulled it on to a curve. The result was, the brakes became very tight on one truck and slacked up on the other one.

Int. 10. In which direction did you draw the car with the locomotive at this time?

Ans. We coupled on to the short-chain end of the car, and pulled this truck on to the curve—drew it forward on to the curve. This curve was what I call a reverse curve. That let the brake up, and we pulled this truck out into a straight line—or both of them—pulled them both from a reverse curve on to a straight line, and set the brakes by the same power while on the straight track, and backed the other truck—the left-hand one—on to the curve. The result appeared to be about the same. It would slack up on one and tighten on the other. It was a wooden brake-shoe, and I bored a hole in the centre of it so that I put in an iron rod to try this brake, to see where there was the greatest power—bored a hole in the centre of the brake-shoes of the car. I did this in order to make it as sensitive as possible in trying the power on the brakes. I bored the hole right through the centre of the
1206 bearing of the brake-shoes, for the object of testing the power on the four wheels on the same side of the car.

Int. 11. In the case of the truck upon the wheels of which you say the brake was tightened when it passed from a straight track on to a curve, and vice versa, what effect did this tightness produce on those wheels?

Ans. It would slide. In one trial it slid one pair of wheels, and in another it slid both pairs. And then the other truck would operate about the same. Sometimes one pair would slide, and sometimes the other pair would.

Int. 12. And on the left-hand truck, where the brakes were loose when those on the right-hand truck were tight, how loose were they?

Ans. So that you could put in this rod and very easily move the brake-shoe. A child could do it. I should say there would not be more than one-half the power on the truck, where the brakes were loose as I have stated, of that on the other truck.

Int. 13. You stated what occurred as between the right-hand truck and the left-hand truck, the wheels of one sliding and the brakes on the other being loose when the engine was hitched to the short-chain end of the car, and the car was driven forward from a straight track on to a curve. Now, will you also please state what effect was produced as between the wheels of the left-hand truck and those of the right-hand truck when the car was backed by the engine from a straight track on to the curve, and a reverse curve, and the brakes applied ?

Ans. I am not prepared to say exactly what the result was different. I tried those trucks or wheels as I found them, without taking much notice whether the left-hand brake was set up or the right hand. I couldn't say here how many times we applied that or how many this, or how many more times we set that up than we did this. There 1207 was nothing particular said about that having any different effect.

Int. 14. I don't think you understand my question. What was the effect upon the left-hand truck and the right-hand truck when the car, after having been drawn forward from a straight track, through a curve, on to another piece of straight track, with the brakes applied on this last piece of straight track, was backed from this last piece of straight track through the curve and reverse curve again ? and if there was any difference in the operation of the brake when this was done from what it was before, please state it.

Ans. It seems to me that we didn't have much to do with that brake. Still, I couldn't say.

Int. 15. I am still inquiring about the short-chain brake, and wish to know what was the effect upon the trucks of the car when the car, with that brake applied, was backed from a straight track through a curve.

Ans. I can't state any different result from that when the car was drawn forward. Place the right-hand truck in the same position, and the result, so far as I could say, was the same, whether the car was backed or drawn forward.

Int. 16. Please state what was the effect when the brake was applied and one of the trucks was on the straight track and the other truck was on the curve; and then what was the effect when the truck which had been on the straight track went on to the curve, and the truck which had been on the curve went on to the straight track ?

Ans. As I said before, place those trucks, one on the straight track and the other on the curve, and I could see no difference in the trucks.

Int. 17. You say you could see no difference. What took place as to the brakes at these times in the one truck as compared with the other ?

1208 Ans. I don't know as anything more would take place than what I stated.

Int. 18. State again what took place.

Ans. The wheels of one truck would slide—sometimes one pair, and then two pair—and the brakes of the other truck slack.

Int. 19. Which truck would it be in which the wheels would slide—the truck which was on the curve, or the truck which was on the straight track ?

Ans. The one on the curve.

Int. 20. In all cases, whether the car was drawn forward or backward, was this so?

Ans. I can't state as for forward and backward. We had considerable of it, and I didn't notice very much about that. I wanted to know whether the bearing and the brakes were working when on the curve and on the straight line, and that was what I looked for, and I think I got it. The rest of it wasn't of much consequence to me, whether it was backing on the curve, or pulling, or drawing, or any other way. I didn't try to keep the record of anything.

Int. 21. You didn't observe any difference either way?

Ans. No; I didn't go into all those. I hadn't but a little time.

Int. 22. Please state whether you measured any or all of the curves on which you tested this car, as described; and, if so, will you please state what measurements you made?

Ans. We had a tape-line, and took the ring and thirty-five feet on the line, and went right across wherever it would strike the rail in the curve, and then measured from the rail to the tape-line in the centre, between the extremes of the thirty-five feet, and the curve that that ran round, I think, was ten inches in the thirty-five feet; in the centre, between the tape-line and the rail, equidistant from the two extremities, was ten inches.

1209 Int. 23. You say that the shortest curve was ten inches. What were the measurements of the other curves?

Ans. I think that one other curve was about six inches. I won't say whether it was five and a half or six. There were other curves varying from two and a half to five inches, measured in the same way. In each case the chord of the circle, as before stated, was thirty-five feet.

Int. 24. In your testimony for the defence, in Springfield, August 5, 1872, you testified about the Springfield brake having been put upon car No. 24, on the Providence and Worcester Railroad, and having been complained of that it would not hold the train, and being taken off. Will you please look at the drawing now shown you, and state whether or not it correctly represents the manner in which said brake was applied on said car? Take the drawing on the assumption that the red lines upon it indicate that the parts upon which the red marks are placed are understood to be erased.

(The drawing shown to the witness is put in evidence, and marked "Complainant's Accounting Exhibit First Providence and Worcester Springfield Brake, F. A. D.")

Ans. It is correct in every way, except that the short balance-lever was so short that the middle hole for the chain to hook into was not placed between the other two holes, as it is shown to be in the drawing. It might have been, but I thought in drilling it between the other two, it would be drilling pretty close to the other; and so, in drilling it, I drilled it just a little out of the line of the other two holes.

Int. 25. Please state whether, after the tests made last week, as just described—with the short chain nineteen and a half inches long—you made any tests on the same car with any chain longer than this nineteen and a half inches one; if so, at which end of the car was it, and state whether there was any platform at the end of the car, and, if so, about what the length of the chain at that end of the car was? 1210

Ans. I have no recollection of noticing any particular test. On one trial I was on the car myself, and turned up the brakes myself, and didn't get off to see the difference of these two brakes. At the left-hand end of the car shown in Complainant's Accounting Exhibit Second

Providence and Worcester Springfield Brake there was a temporary platform, which made the distance from the hole in the truck-lever to centre of the windlass three feet five and a half inches, which was the length of the chain.

Int. 26. How many chains were there at that end of the car?

Ans. One long chain.

Int. 27. The brake of which truck did this chain operate?

Ans. It was attached the same as it is in the exhibit. It operated the left-hand truck—the one nearest that windlass, and from that windlass the brake at that end of the car was operated by a rod hooked into the top of the same lever into which this three and a half feet chain hooked, and there was only one chain round the windlass at this end of the car.

Int. 28. You have stated that you did not notice any particular test; please state what you mean by that.

Ans. With the long chain. I didn't notice the different effect the brakes had when that long chain end was applied. I don't know as I thought of it.

Int. 29. I don't understand whether you mean that you didn't notice whether there was any difference in the effect as between this end of the car and the other end, or that you didn't notice any difference in the effect. State which you mean.

1211 Ans. When I tried these brakes, I didn't look to see which brake was set up. I don't recollect now at which end the power was applied, whether it was the short end or the long end. I went right here to those wheels and tried the brakes. They had an engine, and they placed this car backwards and forwards, and I was there part of the time. I didn't go through all these little things; didn't think of it; didn't want to. I just went out there for satisfying myself whether that brake would hold on the curve and on a straight track at the same time with the same power; and when I got that done I had done all that I supposed would ever interest me at all. That was all I wanted of it. I had been told that it would and that it wouldn't.

Int. 30. Then state whether or not you did notice any difference in the effect of the brakes on the wheels at any time during the tests which you have described, whether the brakes were applied at one end of the car or the other.

Ans. I say I have no recollection of making a special test of the long chain and then the short one; I didn't notice any difference. I have no recollection.

(Question repeated.)

Ans. I didn't notice any difference in the effect of one windlass or the other.

Int. 31. State whether, when these tests were made, you saw the brakeman apply the brakes to this car.

Ans. I did. I saw him set them up on each end. I had a man on the car on purpose to do it.

Int. 32. Now, will you please describe once more the way you tried the brake shoes to see how they were bearing upon the wheels when the brakeman had so set up the brakes?

Ans. I took an iron bar about three feet long, seven eighths or three-quarters round, and placed it in this hole in the brake-shoes, and worked the brakes off from the wheels. There was no other correct way
1212 of doing it, from the fact that the brake was jointed, and you could tip one end more or less if you worked right from either end. And if you came in the centre, where the bearing came on the

wheel, and where the hole was (that was a patent idea of mine, you know, to do that), it was very easy in that way to see the difference in the bearing. I did this on these four wheels on one side of the car, in the different positions of the car, sometimes on the straight track and sometimes on the curve. We set them on the straight track and tried them first on that, to see that they were both equal on both trucks, and then went on to the curve and tried them on the curve. I found the brakes slack on one truck and very tight on the other.

Int. 33. You have said that the brakeman applied the brakes, in these tests, at each end of the car?

Ans. Yes, sir.

Int. 34. State whether you made the trials with the iron bar, as just stated, both when the brake had been applied from the right-hand end of the car, and also when it had been applied from the left-hand end of the car.

Ans. Yes, sir.

Int. 35. Now state whether there was any difference in the results as to the brake-shoes bearing upon the wheels, whether the brakeman applied the brake at the right-hand end of the car, or whether he applied it at the left-hand end of the car?

Ans. I didn't notice any.

Int. 36. In the form of the Springfield brake, as you tested it last week, as described here to-day, would you consider it safe to run on a car upon a railroad?

Ans. That is a hard matter to decide. I could, perhaps, say it would be to a certain extent. What I mean should be understood by that is, that I shouldn't consider it safe to change from the main track on to turnouts with a brake like that set up. I think the car, if empty, 1213 would be liable—if we went out on a side track and should find a rail that had slipped a quarter of an inch out of line at a joint—the flange would be very likely to jump off the track—would be liable to leave the track on the short-chain end.

Int. 37. How frequent an occurrence is it that a rail is out of line a quarter of an inch?

Ans. I don't think it occurs very frequently on the main line; but sometimes turn-outs are not taken care of, and running heavy engines upon them throws the joint out of line; and in those cases it would not be safe.

Int. 38. As the car-master of a railroad, would you use the Springfield brake in any form in which you have ever seen it upon the cars of a railroad?

Ans. I think not.

Int. 39. You testified for the defence at Springfield, August 5, 1872, in relation to a test made a little while ago on the Providence and Worcester Railroad in reference to seeing whether the Tanner brake or the Hodge brake would best hold a car when the engine was pulling it.

Ans. Yes, sir.

Int. 40. Will you please state at about what part of the centre lever—in the case of the Tanner brake in that test—the rods which ran to the truck-levers were hooked in?

Ans. At nine inches from the hole in the ends of the centre lever.

Int. 41. And what was the length of the centre lever?

Ans. I think that was about four feet.

Int. 42. Will you state more fully than you did in August what was done in this test?

Ans. I put the Tanner brake on to car No. 26, and coupled it on to a car that had the Hodge brake. I took a locomotive and coupled on. We stood on a straight line with that car No. 26. I set the brake 1214 with all my power on car No. 26, while standing on the straight line—the brake on the car having the Hodge brake not being applied—and hauled it on to the curve, and stopped. I got off of the car, stepped off of the platform by the side, and gave a motion to the engineer to go ahead. In starting he slipped the driving-wheels a little—just slipped and caught. He hauled the car ahead the length of it and stopped. I let the brake off of this car No. 26, and backed up the length of it, set the Hodge brake on the other car—the Tanner brake on car No. 26 not being applied—and drew the other car to the same point where we stopped with No. 26; and it was my opinion that the Tanner-brake car took much more power from the engine to pull it than did the other car with the Hodge brake. There were quite a number of our men present, and that was the general opinion of all that stood by—that it took more power to pull the Tanner-brake car than it did the Hodge.

Int. 43. What kind of a car was the car in this test which had the Hodge brake upon it?

Ans. A first-class passenger-car. They were both first-class passenger-cars.

Int. 44. Was the Hodge brake in good order, properly adjusted?

Ans. I don't know anything to the contrary. The car was running regularly in the train—had come in that morning. The two cars were made at Springfield, when we had six cars to be made—all one pattern. There was no difference in the weight of the cars, to my knowledge—cars of the same pattern, length, width, and every way.

Int. 45. Will you please state about how much play you allow upon your road between the swing-beam of the cars and the truck-timbers between which the swing-beam hangs?

Ans. Laterally?

Int. 46. No; how much longitudinally?

Ans. We do not make any. Of course they will get a little 1215 by time—by wear; but when we put them in, we put them in just so they will move—as tight as we can and have them move.

Int. 47. When they get worn by time what do you do with them?

Ans. We commence with a half-inch plate when new—what we call friction-plates. Sometimes it is chilled-iron, and sometimes it is not. I have put in both. We take out the thin plate, and if we can get in one an eighth of an inch—if that will fill up the space—we put in a five-eighths; and if it requires three-fourths, we have all different thicknesses to take up what swinging motion there is. That is the manner that I follow in all my trucks, and watch it close. If we find a quarter of an inch, I wouldn't take a car off for the sake of putting in those plates; but I wouldn't allow a car to go out of the shop that had an eighth of an inch play. I would change it for an eighth.

Int. 48. Will you state whether, within a few days, you have made upon the Providence and Worcester Railroad any test for the purpose of ascertaining what was the effect upon the operation of the brake on the wheels at one end of the car or the other when the swing-beam was worn sufficiently to allow of play between it and the truck-timbers in which it hangs? and, if so, please state when you made the test, what brake or brakes you made it with, how much play there was for the swing-beam, and what was the result.

Ans. We made tests yesterday with a car that had three-quarters of an inch play between the swing-beam and the cross-timbers of the truck.

We took the plates out in order to give it play. The first test we made was with a bar—the car standing still. We found we couldn't move the truck but half an inch towards the centre of the car. We took a locomotive and drew the car—started it about as fast as a man would generally walk—and applied the brake while in motion. We 1216 found the truck to incline to the centre of the car—under the influence of the brake, so that this swing-beam had touched the timber.

Int. 49. Which truck was it?

Ans. The truck which had this play. The other truck didn't have any. It was the rear truck of the car. The brake we tried was the Tanner brake.

Int. 50. From your experience with car brakes, what would be the effect upon the trucks of the application of the brakes, supposing that there was play for the swing-beam?

Ans. It is my opinion that they would both travel, when the brakes were applied, towards the centre of the car until they brought up to the swing-beam—as far as they could go.

Int. 51. Please state whether you apply this answer to a car when it is in rest or to a car when it is in motion?

Ans. To a car in motion.

Int. 52. State how it would be when the car is at rest?

Ans. It is my opinion that you couldn't move those trucks, while at rest, far enough to take up that amount—say three-quarters of an inch. You might gain something, but you have got a great power there to move with your brakes—standing.

Int. 53. Would you move anything, do you think?

Ans. The trucks would incline one towards the other, because they are pulling right towards the centre. I never have noticed this point very particularly as to that point of inclining, but I have noticed the motion of a swinging bolster while a train was in motion—the operation of it—the working of it. But when trains have been running fast and the brake is applied, I never took an opportunity to examine for that point. That is simply my opinion from the power applied—that it naturally must follow that by applying these two brakes—being 1217 attached in the centre arbitrarily—they must pull toward that centre. I am speaking now of the Tanner brake.

Int. 54. You say "the two brakes." Please state what you mean?

Ans. It is a double brake, applied to the two trucks.

Int. 55. With these trucks pulling towards the centre when the brake is applied, as you say, state whether or not there would, with the Tanner brake, be any unequal effect upon one truck as compared with the other.

Ans. I don't think there would be. I don't believe there can be a difference there that could ever be figured up in the wearing of the shoes or anything of the kind.

Int. 56. What would be the effect of the Hodge brake in reference to drawing the trucks towards the centre of the car when the brake is applied, if there be play for the swing-beams?

Ans. The Hodge brake has a movable point—a movable swinging motion—which would overcome all the difference, if there would be any; this swinging motion would overcome it so that it would make the trucks all move equally.

(Question repeated.)

I can't see any difference as to that if you put the same power. It

has the same tendency to draw the trucks towards the centre of the car in the case of the Hodge brake as in the case of the Tanner brake.

Int. 57. Has the Tanner brake been in general use upon the cars of the Providence and Worcester Railroad since you have been car-master of that road?

Ans. Yes, sir.

Int. 58. For about how long a time was it in general use there?

Ans. I cannot state. We might have used it three years and might have used it five. But we used it till we bought the Hodge. The
1218 **connections to windlasses and trucks were made at the ends of the centre lever.**

Int. 59. State whether the Tanner brake was the first double-acting brake which was used on the Providence and Worcester road?

Ans. Yes, sir; it was.

Int. 60. Did it continue in use there until the road bought the Hodge brake?

Ans. Yes, sir.

Int. 61. State whether, while the Tanner brake was in use there, there was ever any difficulty in regard to the manner in which it applied the brakes to the wheels of the car?

Ans. No, sir; we had no trouble with it at all, to my knowledge.

Int. 62. It was a good and efficient brake, was it?

Ans. Yes, sir.

Int. 63. When M'r S. M. Whipple, now present, first came to the Providence and Worcester Railroad in regard to putting the Springfield brake upon that road, did he have any conversation with you in reference to having said brake put on said road? If so, what was the conversation?

Ans. We did have. Of course I knew nothing about what the object was. I never saw the brake before, and whether I inquired of him what his object was I can't say. But I will state that he said that (as near as I can recollect) he considered the Springfield brake just as good as the Tanner; and if it was, that the railroad companies could adopt it and wouldn't be obliged to resort to the single brake; damages would be much less, or something to that effect. That is as near as I can recollect.

Cross-examination waived.

OLNEY L. SMITH.

1219 **PELEG M. PECKHAM, of Providence in said district, having been duly sworn according to law, testifies and says, as follows:**

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

Ans. Peleg M. Peckham. I am forty-nine years old. I live in the city of Providence. I am first foreman of the Providence and Stonington Railroad Company's car-shop at Providence.

Int. 2. Are you familiar with the forms of brakes known as the Tanner brake and the Hodge brake?

Ans. I am.

Int. 3. How long have you been engaged in the car-shop of the Providence and Stonington Railroad?

Ans. Twenty-six years.

Int. 4. State, if you know, what was the first form of double-acting brake which went into use on said road?

Ans. The Tanner brake.

Int. 5. Who, if you know, first put the Tanner brake on the cars of that road?

Ans. M'r Rutter and myself.

Int. 6. For about how long a time did the Tanner brake continue in general use on said road?

Ans. We used it in general use probably about ten or fifteen years, and we are using it now on some cars.

Int. 7. You say you are using it now on some cars. Will you mention any trains in which any car having that brake on is run?

Ans. The steamboat train, carrying passengers between Providence and Stonington, on the line between Boston and New York.

Int. 8. What brake is at the present time in general use on said road?

Ans. The Hodge brake.

1220 Int. 9. State whether the Tanner brake continued to be in general use on said road down to the time the company bought the Hodge brake?

Ans. It did.

Int. 10. While the Tanner brake was used on said road, how well did it work?

Ans. It worked very well.

Int. 11. Did you ever have any trouble with it in any way?

Ans. No, sir.

Int. 12. Please state why you made the change from the Tanner brake to the Hodge?

Ans. The reason we made the change was to do away with the long rod that connected from the centre-lever to the levers on the trucks; to do away with the friction of those long rods.

Int. 13. About how much, if any, play between the swing-beam and the truck-timbers between which the swing-beam hangs, is there in the cars upon your road when they are in order?

Ans. There isn't any. We don't calculate to have any.

Int. 14. Suppose by wear there should come to be play, what, if anything, would be the effect of the application of the brakes upon the trucks of the car when the car was in motion?

Ans. It draws the two trucks towards the centre of the car as far as the swing-beams will let them go.

Int. 15. State whether or not in this respect there is any difference between the effect of the Tanner brake and the effect of the Hodge brake?

Ans. I can't see any difference.

Int. 16. When you used the Tanner brake on your road, was there ever any difficulty in the application of the brakes upon one truck as compared with the other by reason of any play in the swing-beams?

Ans. No; I couldn't see any in that. But I think that the ap-
1221 plication of the brake on one end of the car, drawing from a
straight rod to the lever on the rear truck—of course the lever on the other side springs a little, which would make a little difference in the application.

Int. 17. State whether you ever found this difference to be of much importance when you used the Tanner brake.

Ans. No; I don't think it makes any material difference.

Cross-examination waived.

PELEG M. PECKHAM.

Examination taken, reduced to writing, and by the witness sworn to before me this ninth day of September, A. D. 1872.

FRANCIS A. DANIELS,
U. S. Commissioner.

CHARLES H. SMITH, of the city of Providence, in said district of Rhode Island, having been duly sworn according to law, testifies and says as follows:

Direct examination by M r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

Ans. My name is Charles H. Smith. I am the master car-builder's clerk on the Providence and Worcester Railroad; age, twenty-eight; residence, city of Providence.

Int. 2. Please state how long you have been master car-builder's clerk.

Ans. About two years.

Int. 3. Please state whether you were present last week at a test made on the Providence and Worcester Railroad with a car having the Springfield brake upon it; and, if so, whether you noticed the action 1222 of the brake-shoes upon the wheels of that car when the brake was applied on a straight track, and the car was then drawn onto a curve, and then onto a reverse curve; if so, please state what those results were.

Ans. I was there nearly all the time they made the test, with the exception of the afternoon. I saw the car move on the single curve, on the reverse curve, and on the straight track. I watched the operation of the wheels, and saw, as the brake was applied to one end—the car standing on the straight part of the track, as it did every time when the brakes were applied—the wheels would slide on one truck and would turn on the other. When they stopped the car they pulled the car back, and we would take an iron bar—I did myself—to start the brake-shoes from the wheels. I took my hands and moved the brake-beam away from the wheels. I wouldn't pull it away, I would start it. That was at that end of the car where the wheels were turning; on the end of the car opposite to that on which the brake was set up. The wheels at the other end of the car were sliding. As they struck the sharpest part of the curve all four of them would slide. Immediately upon striking the curve only one pair would slide. This took place on a short curve with a versed sine of six inches with a chord of thirty-five feet. When the car was placed on the reverse curve they alternated; one end would slide and the other would turn, and vice versa as the trucks changed places on the reverse curve. And at one part of the curve the brakes would be so tight that the engine could not move the car. You pushed the car a little further on and struck a straight line; the wheels on one truck would turn, and then the engine could move the car very easily.

Int. 4. Please state whether, some time last spring, you saw M'r Whipple, now present, at Providence, and had a conversation with 1223 him; if so, please state about when it was, and what the substance of the conversation was.

Ans. I did see him. I can't give the dates exactly, but I think it was some time last spring, say March or April, 1872. M'r Whipple came up into the office of the car-shop of the Providence and Worcester Railroad, and inquired if M'r Olney L. Smith was there. I told him he was away. He then asked by what authority, or who authorized that Springfield brake to be taken off the car on the Providence and Worcester road, which was put on. I looked up and hesitated a moment about answering, because I wanted to know who he was. He stated his name was Whipple, and he was attorney for the Eastern Railroad Association. I went to a drawer in the desk and produced a letter from M'r Hilton, the superintendent of the Providence and Worcester Railroad. He read the letter, and immediately exclaimed that that had undone or defeated (I have forgotten; words to that effect) what he had been trying to accomplish for the last six months, and it would cost this or some other road (I have forgotten the exact expression) a hundred thousand dollars. I don't know what road he stated. That is all.

Int. 5. Cost the road a hundred thousand dollars, for what?

Ans. I didn't have the means of knowing what. I supposed for some suit they had got into.

Int. 6. I mean was any patent mentioned?

Ans. No patent at all.

Int. 7. Or any brake mentioned?

Ans. This Springfield brake was mentioned.

Cross-examination waived.

CHARLES H. SMITH.

Examination taken, reduced to writing, and by the witness sworn to before me this ninth day of September, A. D. 1872.

FRANCIS A. DANIELS,
U. S. Commissioner.

1224 George L. Gates, of Uxbridge, in the State of Massachusetts, having been duly sworn according to law, testifies and says as follows:

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

Ans. My name is George L. Gates; I am a brakeman on the Providence and Worcester Railroad; age, thirty-nine; residence, Uxbridge, Massachusetts.

Int. 2. How long have you been a brakeman on that road, and what kind of trains have you been accustomed to brake there?

Ans. Been on there three and a half years, on passenger-trains.

Int. 3. Do you recollect there being a brake called the Springfield brake, and also the Tanner brake, put upon passenger-cars and run in passenger-trains on the Providence and Worcester Railroad?

Ans. I do, sir.

Int. 4. What trains were those, and between what points did they run?

Ans. They ran clear through to Worcester; left here at seven o'clock at night and went as far as Uxbridge; lay over night there and went to Worcester the next morning, and came back from Worcester the next day at night.

Int. 5. State, if you know, what were the numbers of the cars upon which this Springfield and this Tanner brake were put.

Ans. Twenty-four and twenty-six.

Int. 6. State who were the brakemen on that train.

Ans. Myself and a fellow called Allen Sweeting were the first two that used them.

Int. 7. And what two afterwards?

Ans. Leslie Crocker and myself.

1225 Int. 8. While those brakes were on that train, state who applied them.

Ans. I applied them myself when they were first put on.

Int. 9. State how the Springfield brake on that train worked as to holding the train.

Ans. I couldn't do anything at all with it—couldn't hold the cars with it—nor train at all.

Int. 10. Was it afterwards taken off of that car?

Ans. It was.

Int. 11. State what, if any thing, you know about how it came to be taken off?

Ans. Well, sir, I used the brake until I complained to M'r Olney L. Smith, master car builder, and to M'r Hilton, the superintendent of the road. M'r Hilton took the car from my train and put it on another train —the accommodation train for Worcester that goes up at noon and back at night. It ran there until the brakeman on that train complained of it, and wouldn't use it. It was taken off and put back onto my train, and this young man here, M'r Crocker, was put on to brake behind, and I was put in the baggage-room. I went to M'r Olney L. Smith and asked him if he wouldn't take that brake off. I told him that as long as the old men on the road couldn't use it I didn't think that a boy could, and the boy complained about it. M'r Smith said to me he couldn't do it without orders from M'r Hilton. I went to M'r Hilton. I met him in the depot there and told him about their changing this brake and putting it onto my train, and I couldn't do anything with it; that I had asked M'r Smith to take it off and he says to me he couldn't do it without your order. He wrote a note and sent it to M'r Smith, and the brake was taken off.

Int. 12. Please state who operated the Tanner brake that was on that train as you have stated.

1226 Ans. I did some of the time,, and Leslie Crocker did; and it was there on one of the other trains. I don't know on which of the other trains.

Int. 13. While you operated it on that train, how well did it work?

Ans. It worked very well. It worked a little harder than the Hodge brake.

Int. 14. As to holding the train, how did it work?

Ans. Well, I think it works the best of any brake I ever used in holding a train of cars.

Int. 15. State whether, after the Tanner brake was first put upon that train, it was again put upon it.

Ans. It was used afterwards.

Int. 16. How did it work the second time?

Ans. It worked better, if anything, than it did the first. It worked well both times.

Cross-examination by M'r Whipple:

Cr. int. 1. Then in your judgment the Tanner brake is a great deal better than the Hodge brake?

Ans. To have my choice about it, sir, I would rather have the Tanner brake than any brake I have ever used.

GEORGE L. GATES.

Examination taken, reduced to writing, and by the witness sworn to, this ninth day of September, A. D. 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

LESLIE CROCKER, of Providence, in said district, having been duly sworn according to law, testifies and says as follows:

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

1227 Ans. Leslie Crocker; age, eighteen; residence, city of Providence; I am brakeman on the Providence and Worcester Railroad.

Int. 2. How long have you been brakeman on that road?

Ans. Ever since a year ago last Thanksgiving.

Int. 3. What kind of trains have you been brakeman upon?

Ans. All the passenger trains.

Int. 4. Do you recollect that last winter there was a brake called the Springfield brake, and also one called the Tanner brake, put upon the a ins on that road?

Ans. Yes, sir.

Int. 5. Who braked those cars in those trains, if you know?

Ans. When they were first put on, George Gates and Al. Sweeting; and then I went on.

Int. 6. Is George Gates the witness who has just been sworn?

Ans. Yes, sir.

Int. 7. After you went onto the train, who braked on the cars with those brakes on?

Ans. George Gates and myself.

Int. 8. Upon which one of the cars did you brake yourself?

Ans. The Springfield brake and the Tanner brake.

Int. 9. How well did the Springfield brake work as to holding the train?

Ans. I didn't see that it held the car itself; I used it about a week and I told the conductor I wouldn't use it any more.

Int. 10. How well did the Tanner brake work?

Ans. That worked well.

Int. 11. After the Tanner brake was put onto the train at that time, was it again put on afterwards?

Ans. It was.

Int. 12. Who braked on it when it was put on afterwards?

1228 Ans. I did.

Int. 13. How well did it work this last time?

Ans. Tip-top.

Int. 14. How well did it work the last time, as compared with when it was put on the first time as you have stated?

Ans. I thought it worked easier.

Cross-examination by M'r Whipple:

Cr. int. 1. How do you like the Tanner brake compared with the Hodge brake?

Ans. I like it better, if anything.

LESLIE CROCKER.

Examination taken, reduced to writing, and by the witness sworn to, this ninth day of September, A. D. 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

MARCUS L. BRAMAN, of Providence, in said district, having been duly sworn according to law, testifies and says as follows:

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

Ans. Marcus L. Braman; age, thirty-one; residence, city of Providence. I am night watchman in the barn of Albert Weaver, who draws all the Providence and Worcester cars to and from the wharves and freight station in Providence.

Int. 2. Were you a little while ago employed as a brakeman on the Boston and Albany Railroad?

1229 Ans. Yes, sir.

Int. 3. What trains did you brake on on that road?

Ans. I first braked on the Merchants' Union Express, leaving Boston at 7.20 p. m. and arriving at Worcester at 8.45. That is not a passenger, but a freight train. After that I went on Conductor Jennings' train, leaving Boston at 5 a. m.; arrives at Springfield at 8.50; leaves there at 11.30, and arrives at Boston at 3.30 p. m.

Int. 4. About how long did you brake on Conductor Jennings' train?

Ans. I braked on that between thirteen and fourteen months.

Int. 5. When did you leave the employ of the Boston and Albany Railroad?

Ans. Either the last days of May or the first of June, 1872.

Int. 6. At the time you left the said road, do you recollect the name of the brakes that were used on the cars of Conductor Jennings' train on alternate days?

Ans. Yes, sir; there was the Springfield brake and there was the Hodge brake.

Int. 7. State whether you yourself braked on the cars having the Springfield brake in that train.

Ans. Yes, sir; I did.

Int. 8. For about how long a time did you brake on those Springfield-brake cars in that train?

Ans. Somewhere in the neighborhood of three or four months. They put them on in the first of February, and I left the last of May or the first of June.

Int. 9. How did those Springfield brakes work as to holding the train?

Ans. Worked very poorly.

Int. 10. State what difficulty you found with them while you braked on them.

1230 Ans. The most difficulty I found I couldn't hold the train with them. They didn't work—didn't do the work.

Int. 11. State whether you ever noticed with those Springfield brakes about the chain winding unequally on the windlass staff.

Ans. Yes, sir; I have noticed very often. There is a ring-bolt attached to the end of it that goes through the shaft, and one chain or the other was almost sure to catch on the point of the bolt or the eye where it goes through the windlass shaft.

Int. 12. When the chain did so catch on the eye-bolt, how would it wind then?

Ans. One chain would wind tight, and the other chain would be perfectly slack—hang right down.

Int. 13. When the chains wound in that way unequally, what was the effect of the brake in regard to holding the car?

Ans. You couldn't discover that there was any brake on the car at all—couldn't discover that it held the car a mite.

Int. 14. At any time while you were breaking on Conductor Jennings' train, do you recollect a car being in it with the Tanner brake on it?

Ans. Yes, sir.

Int. 15. State who braked that car with the Tanner brake.

Ans. I braked it sometimes, and sometimes I didn't. It was shifted in the train; but I braked it the biggest part of the time.

Int. 16. When you braked it, how did the Tanner brake work in respect to holding the train?

Ans. It worked very well. The most trouble I found with it it worked a little hard—stiff. It didn't work as easy; you had to use more muscle. I don't know but it would work nearly as well as the Hodge if you put as much muscle in it. But it wasn't as pretty a working brake.

1231 Int. 17. In the case of this Tanner brake on this car, do you recollect how the centre lever lay across the car when the brakes were loose?

Ans. Yes, sir; it lay directly across crossways under the car.

Int. 18. At about a right angle?

Ans. Yes. sir.

Int. 19. When the Tanner brake car was first put into that train, how many cars were there in the same train with the Springfield brake on?

Ans. I think there was one when it was put in. I know there was one.

Int. 20. At this time, at what portion of the train was this car with the Springfield brake on placed?

Ans. At the rear end of the train. It made a round trip at the rear end of the train, and then the Tanner brake made a round trip afterwards. They ran out of Boston to Albany and back again, so that they alternated—shifted them every round trip.

Int. 21. Have you any knowledge of an accident happening in shifting those cars with the Springfield brakes on them? If so, please state what you know about it.

Ans. Yes, sir; I was running on the train, and was taken sick in the morning. I came in at night. I had a brother running on the Newton Lower Falls train. When we came in at night I asked Mr. Hobert, the depot master. Told him I was sick, and asked him to let my brother do my switching. So he did, and I went home. The first thing I heard in the morning was that the bunter post in the depot was all smashed off, and the rear platform of the rear car and the platform of the second car.

Int. 22. Do you recollect the number of that car?

Ans. No, sir; it was 123 or 124. I don't know which car was behind.

Int. 23. How badly smashed were the platforms of either of these cars?

1232 Ans. The rear platform of the rear car the bed-pieces were broken off. That was the car that struck the post. And the rear platform of the second car was injured. It wasn't smashed off entirely, but it was so that it had to be sent to the shop to be repaired.

Int. 24, Who was doing the switching at this time?

Ans. My brother, Thomas Braman.

Int. 25. When the Springfield brake and Tanner brake were first run in this train and operated by you, what, if anything, was said to you about the Springfield brake?

Ans. At the first time that ever I braked on these cars we started out of Boston and came to the Know Nothing station, where the road crosses the Boston and Providence track, and we ran the train right on to the crossing instead of stopping where we wished it. There was nothing said then; and we got as far as Framingham, and the train ran by the station. I got off the train and began to look under the train. The conductor came back and wanted to know what the devil the matter was. Said I, "I don't know; that is what I am trying to find out." Said he, "If you can't hold the train with that brake, you can't with any brake, for that is the best brake that was ever put on a car." And I was discouraged. And that's the way it was all the way through.

Int. 26. What brake was Jennings referring to?

Ans. The Springfield brake.

Int. 27. At said time when the one car with the Springfield brake on and the car with the Tanner brake on were in Jennings' train, where was the rear brakeman stationed?

Ans. On the rear car always.

Int. 28. Who was that rear brakeman?

Ans. I was the man.

Int. 29. How well, if at all, were you able to take up the slack of the train when the Springfield brake car was the rear car of the train?

Ans. It was impossible to do it.

1233 Int. 30. How well were you able to do it when the Tanner brake car was the rear car?

Ans. With the Tanner brake I never had any trouble in taking up the train, or in holding the train at any place.

Int. 31. How long, in all, were you engaged as brakeman on various railroads?

Ans. Between eight and nine years.

Int. 32. And how much of this time on the Boston and Albany Railroad?

Ans. About two years and a half altogether.

Int. 33. Are you quite a strong, powerful man?

Ans. Yes, sir; I consider I am a strong man.

Int. 34. State—from your experience as a brakeman—what is your opinion, and how did you feel while on the Boston and Albany road in regard to riding on this train that had the Springfield brakes on it.

Ans. I never considered it was safe to ride on the train. I never felt myself safe while they were in use.

Int. 35. State why you left the Boston and Albany Railroad in May or June, 1872.

Ans. When they put these Springfield brakes on there was nothing but a jaw and quarrel all the time with Jennings. Always gave perfect satisfaction before; never had a word with him until this time. And I made up my mind that if they wouldn't put on a brake that I could hold the train with, I would leave the road. I made them a bill of my time and left it.

Cross-examination by M'r Whipple:

Cr. int. 1. Did you, or not, state to M'r Whipple, who is now present,
that you wanted no better brake than the old Springfield brake
1234 on car No. 124, and that you could snap the train right in two, if
it was necessary, in taking the slack?

Ans. No, sir; I never did.

Cr. int. 2. Did cars 123 and 124 have to go into the shop for repairs in consequence of the platforms being smashed off?

Ans. Yes, sir.

Direct examination resumed:

Int. 36. Did you tell M'r Whipple, or anybody else, what has been inquired of about the brakes in respect to the Tanner brake on 123—that you could snap the train in two, if necessary?

Ans. I believe I did—yes, sir. Yes, sir; that Tanner brake is a very good brake. There is no trouble but what you can snap a train, if they want it done. But as I told you before, it wanted a little more muscle. It is a very good brake.

Int. 37. To whom was it that you said this?

Ans. I couldn't tell the gentleman's name. There is the gentleman. (Pointing to M'r Whipple.) I don't know that the platforms were all smashed off; but they were injured so that they had to go into the shop for repairs.

Int. 38. Please state what makes you think the cars were sent into the shop for repairs.

Ans. I know they were left out of the train as unfit for use. I don't know that they were taken into the shop or whether they were left in the depot. That is more than I can tell. But I know that they were repaired somewhere.

Int. 39. After the platforms of the cars were injured in this way, who switched the cars out of your train?

Ans. I did myself.

1235 Cross-examination resumed:

Cr. int. 3. Were the platforms so damaged that the brake could not be used on them?

Ans. Yes, sir.

Cr. int. 4. Did this accident happen to the platforms of the cars 124 having the Springfield brake, and 123 having the Tanner brake?

Ans. No, sir.

Cr. int. 5. How long after the brake was changed from Tanner brake on 123 to the Springfield brake did this happen?

Ans. I couldn't tell exactly to a day. It wasn't a great while. I know we had used them some little time.

Cr. int. 6. You operated the 123 when it had the Tanner brake on, and 124 when it had the Springfield on, coupled together, didn't you?

Ans. Yes, sir; I operated the brakes on the two cars.

Cr. int. 7. In operating the brakes upon the two cars respectively, you had to step from one platform to the other?

Ans. No, sir. It was a five-car train. I had nothing to do with only the rear car. I had one one day, and the other the next. I was at the front end of the rear car.

Cr. int. 8. Then, if I understand you, when you operated 124 with the Springfield brake, you couldn't carry power enough to the wheels to take the slack?

Ans. No, sir.

Cr. int. 9. But when you operated the Tanner brake you had no difficulty in taking the slack and holding the train?

Ans. No, sir.

Cr. int. 10. Then, if I understand you, the Springfield brake communicated little or no power to the wheels of the trucks?

1236 Ans. Very little indeed. It worked better at some times than it did at others. But, as a general thing, it was very poor indeed.

MARCUS L. BRAMAN.

Examination taken, reduced to writing, and by the witness sworn to, this ninth day of September, A. D. 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

SEPTEMBER 19TH, 1872.

RICHARD LYNCH, of the city and county of Providence, in the State of Rhode Island, having been duly sworn according to law, testifies and says as follows:

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

Ans. Richard Lynch; age, twenty-two; live in the city of Providence; I am a brakeman on the Providence and Worcester Railroad.

Int. 2. How long have you been brakeman on that road?

Ans. I have been on there since last February, 1872.

Int. 3. During that time what kind of trains have you braked on?

Ans. I have braked all on passenger trains.

Int. 4. Do you remember recently braking on a train on the Providence and Worcester road, in which was run car No. 26, having upon it a brake called the Tanner brake?

Ans. Yes, sir.

1237 Int. 5. State whether you yourself braked on said car No. 26?

Ans. Yes, sir, I did.

Int. 6. For about how long a time did you brake on that car?

Ans. As long as the brake was left on there—till the car was left off that train. They took the Tanner brake off before they took the car off.

Int. 7. Do you recollect about how long the Tanner brake was on that car?

Ans. I should judge that we had it on my train a little over a week. I couldn't say how much over.

Int. 8. How much of that time did you brake on it yourself?

Ans. Every other night in the week we went out of here at seven o'clock at night, and the next night I had it. I had it out of Worcester going to Providence every other night for a week—leaving Worcester at 6.30. I didn't use it at all going out of Providence.

Int. 9. Who braked on that train going out of Providence while that car was on it?

Ans. Leslie Crocker.

Int. 10. While you braked on said car No. 26, how did the Tanner brake on it work?

Ans. It worked splendid. When you came to set the brake up, there was no trouble whatever. The shoes were right to the wheels and stopped the car. There was no trouble whatever in braking a train with it.

Int. 11. How did its working compare with other double brakes that you have used?

Ans. Well, it worked a great deal different altogether; much easier and much better; didn't have so much hard twisting to do.

Int. 12. Have you, at any time recently, used somewhat a brake on car No. 24, on the Providence and Worcester road, called the Springfield brake?

1238 Ans. I have used it, but I couldn't really remember much about it.

Int. 13. If you remember anything about how it worked, please state it.

Ans. I didn't like it so well. I remember that it didn't take hold so well. There was more slack chain to take up before you got the brake where it ought to be.

Int. 14. How well did it seem to hold the car?

Ans. It didn't hold the car so well as the Tanner brake. We very often used to get talking about brakes on the road, and we would call 26 the "boss" brake. That is what we used to call it on our road.

Cross-examination by M'r Whipple:

Cr.-int. 1. Who put on to the car the brake you called the "boss" brake?

Ans. I don't know who it was put it on. I believe it was the gentleman here, M'r Sayles.

Cr.-int. 2. Do you recollect operating the Tanner brake on the same car?

Ans. Yes, sir.

Cr.-int. 3. At a time previous to the application of it by M'r Sayles?

Ans. I couldn't really say about the application of it from him. But I remember using it just as quick as it came out.

Cr.-int. 4. How did the operation of it, when it first came out, compare with it when the same car came out with the brake on as applied by M'r Sayles?

Ans. It didn't work so well at first. When it came out the second time it worked splendid.

Direct examination resumed:

Int. 15. This first time the Tanner brake was put on, how well did it work?

Ans. Well, it didn't work so well as some brakes on the road.
1239 I preferred the brake that came out the second time—the Tanner brake—to the one that came out first.

RICHARD LYNCH.

Examination taken, reduced to writing, and by the witness sworn to this 19th day of September, A. D. 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

EDWIN A. THOMAS, of North Kingstown, county of Washington and State of Rhode Island, having been duly sworn according to law, testifies and says as follows:

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

Ans. Edwin A. Thomas; age, twenty-two; residence, Wickford, North Kingstown; occupation, brakeman on the Providence and Worcester Railroad.

Int. 2. How long have you been brakeman on that road?

Ans. Three years the first of next November.

Int. 3. What kind of cars have you braked on there?

Ans. Freight and passenger both. I braked freight trains seven months, and the balance of the time on passenger-trains—something over two years.

Int. 4. Have you recently braked on a passenger-train on that road having in it car No. 26 with what is called the Tanner brake on it?

1240 Ans. I have, sir.

Int. 5. About how much have you braked on that car?

Ans. I couldn't state the amount I braked there. All the way I happened to use it was being changed off from my own trains on to other trains on account of somebody's being sick, or off, or something of that kind—as we call it, an extra trip—some part of the time the 6.30 out of Worcester, and some part of it the 7 p. m. train from Providence.

Int. 6. Did you brake on it a good many times in this way?

Ans. No, sir; but a very few times. Probably I might a half a dozen trips. I might have gone to Worcester on it, and then I didn't have anything to do with it for a time. I don't say as I have a half a dozen trips, but I should think somewhere in that neighborhood.

Int. 7. About how often did the train stop at stations during these trips?

Ans. We make twenty stops between Providence and Worcester on an accommodation train.

Int. 8. And the same returning?

Ans. Yes, sir.

Int. 9. In making these twenty stops or so, about how much of the time did you apply the Tanner brake?

Ans. I applied the Tanner brake at every station. We run two cars and a "jim" car—as we call it—a baggage-car. The rear brakeman has charge of both cars either way. He has the same two brakes either way he is going; 26 and whatever other car we have on—21 and different numbers.

Int. 10. While you so braked with this Tanner brake, how did it work?

1241 Ans. I called it a very good brake; what we called the best brake we had on the road. That is, at the time it was on, the car was considered to be the best car to hold; that is, the best brake on the road at the time.

Int. 11. When you so used the Tanner brake on these trains, were you rear brakeman?

Ans. Yes, sir.

Int. 12. And took the slack of the train?

Ans. Yes, sir. The baggage-master used the two on the two passenger cars.

Cross-examination by M'r Whipple:

Cr.-int. 1. What is the name of the brake in general use on the passenger cars of the Providence and Worcester road?

Ans. I couldn't say, sir. It was something I didn't pay much attention to. All the way I happened to notice this was on account of its being a new brake, just put on, and was spoken about more than any other. It was something I never bothered about.

Cr.-int. 2. Do you consider the brake in general use on the passenger cars of that road a good brake?

Ans. Yes, sir. We call them very good brakes. But No. 26 hasn't the reputation of being so good to brake since that was taken off as it was at that time, although there is a very good brake on there now.

Cr.-int. 3. This Tanner brake you speak of—was it put on by M'r Sayles?

Ans. I couldn't say, sir, who it was put on by.

Cr.-int. 4. Was it the same brake spoken of as being put on by M'r Sayles, by the previous witness, M'r Lynch?

Ans. Yes, sir.

EDWIN A. THOMAS.

Examination taken, reduced to writing, and by the witness subscribed and sworn to this 19th day of September, 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

1242 OLIVER A. LOCKWOOD, of Cranston, in the county of Providence and State of Rhode Island, having been duly sworn according to law, testifies and says as follows:

Direct examination by M'r Cozzens:

Int. What is your name, age, residence and occupation?

Ans. Oliver A. Lockwood; age, forty-seven; live in Cranston. I am a brakeman on the Providence and Worcester Railroad.

Int. 2. How long have you been brakeman on that road?

Ans. Eight years.

Int. 3. During that time what kind of trains have you braked?

Ans. Passenger trains mostly. A year and a half I braked a freight train, and the rest of the time passenger trains.

Int. 4. Do you remember recently running as brakeman on a passenger train on that road in which there was a car having on it a brake called the Springfield brake?

Ans. I ran a car last spring that I don't know what they called the brake, but it didn't work well. On one end of the car was two chains around the windlasses, and on the other end was one chain around the windlass. You would get about one turn on the brake and it would fetch up tight, and you couldn't turn it either way; and the car would go on the same as though there was no brake. Sometimes it would hold a little—nothing to be safe with.

Int. 5. Did you yourself brake on that car while that brake was on it?

Ans. I braked on it every other day.

Int. 6. For about how long?

1243 Ans. I don't recollect; because we brakemen made such a fuss about it they were obliged to take it away.

Int. 7. Was it some little time?

Ans. A few days—not many days. I didn't pay much attention. I know we made such a fuss they took it away.

Int. 8. You say above, "and you couldn't turn it either way;" please state more fully what you mean by this.

A. Well, what I mean to say is, I couldn't turn it any further. That's all. I didn't mean to say you couldn't turn it back. But you couldn't turn it any further.

Cross-examination waived.

OLIVER A. LOCKWOOD.

Examination taken, reduced to writing, and by the witness sworn to before me this 19th day of September, 1872.

FRANCIS A. DANIELS,
U. S. Commissioner.

Olney L. Smith recalled.

Direct examination by M'r Cozzens:

Int. 1. You were asked the other day about the length of time that the Tanner brake was continued in general use on the Providence and Worcester Railroad. Will you please state whether, since your examination then, you have looked into the matter of the length of time said brake was continued in use; and, if you have, please state about

1244 when you now find that it first went into use on that road, and about how long it continued in general use there?

Ans. I find the Turner license deed, under which the Tanner brake was put on to that road, was purchased in November, 1851. The brake was immediately put on after the purchase, and used until they purchased the Hodge in 1867.

Int. 2. Did you take off the Tanner brakes immediately on your purchasing the Hodge license?

Ans. I suppose that the order was given to take off the Tanner as soon as the company had purchased their license; and I did as soon as I got orders from the superintendent.

Int. 3. What I want to know is—were Tanner brakes continued in use on the Providence and Worcester road for some considerable time after you first began to put the Hodge brakes on the road?

Ans. Well, they might have been some time. I couldn't state how many days or weeks. We had twenty cars, I think—sixteen passengers, first class, and four second class, at that time. I should say that we took off the Tanner as fast as we could make irons to take their place, and changed them right along.

Int. 4. Was there a period during which there were both Tanner brakes and Hodge brakes running on the passenger cars of the road, before you got the Tanner brakes all off?

Ans. Oh, yes, I presume there were. Oh, yes, we couldn't change sixteen or twenty cars. We had only a few men and wouldn't change them, perhaps, in sixty days.

Int. 5. During this time that both Tanner brakes and Hodge brakes were running on the passenger cars of said road, please state what, if any, difference there was in the effect of the two kinds of brakes as to holding the cars, and general efficiency, when they were both in order?

1245 Ans. I have no recollection of any particular expressions made by the brakemen on the road stating any difference or dissatisfaction with one more than the other. Both out of order they would complain of; and both in order, you would hear no more of one than the other. All satisfactory, both the Tanner and the Hodge.

Int. 6. Will you please state the date when the Tanner brake was recently put on to the Providence and Worcester road in the form desired by M'r Sayles, the complainant in this case?

Ans. March 20, 1872.

Int. 7. How long was it continued on the road in that form at that time?

Ans. Until April 4, 1872.

Cross examination waved.

OLNEY L. SMITH.

Examination taken, reduced to writing, and by the witness subscribed and sworn to this 19th day of September, 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

WILLIAM D. HILTON, of the city and county of Providence, in the State of Rhode Island, having been duly sworn according to law, testifies and says as follows:

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

Ans. William D. Hilton; age, thirty-nine; residence, city of Providence. I am superintendent of the Providence and Worcester Railroad.

1246 Int. 2. How long have you been superintendent of that road?

Ans. Six years.

Int. 3. Will you please state the circumstances under which the brakes called the Springfield brake and the Tanner brake came to be put upon the cars on the Providence and Worcester Railroad last winter?

Ans. I was requested by M'r S. M. Whipple to allow the two brakes to be put upon cars of our road to test the relative value of the two brakes.

Int. 4. Did you order the Springfield brake to be taken off of the car, and, if so, why did you do it?

Ans. I ordered the brakes taken off the car. I had so many complaints from the brakemen as to the operation of it that I ordered them taken off.

Int. 5. Will you please state how the Tanner brake came to be put upon the car on said road the second time?

Ans. I believe it was at that time I met M'r Sayles for the first time. We had some discussion as to the values of the different brakes in use, and I denounced them, I think, somewhat unsparingly, and he contended that the Tanner brake was as good a brake as was in use, if properly put on. The result of the discussion was that I allowed him to put one on the road in the manner that he stated to be the right way.

Int. 6. About how long did the Tanner brake, as M'r Sayles wished it put on, continue on the road?

Ans. I should say rising two weeks; between two and three weeks.

Int. 7. At the end of that time did you order it taken off; if so, why?

Ans. I did. I found there was considerable feeling existing that we should have ordered the other brakes off and allowed another brake to be put on and used, and to compromise the matter I ordered that brake off, so as to make it fair on both sides.

Int. 8. You say a feeling existed; a feeling with whom?

1247 A. I had, I think, a conversation with M'r S. M. Whipple on the matter. His manner—I wouldn't say that it was one of anger, or anything of that kind—but he rather felt that I had not treated them impartially in ordering his brakes off, and then allowing this other to be put on. He didn't demand of me to take this one off, but I did it of my own volition.

Int. 9. So as to be as fair to one side as the other?

Ans. Yes, sir; that was my object.

Int. 10. While the Tanner brake was on your road was there any fault found with it?

Ans. The second time?

Int. 11. Any time?

Ans. I couldn't say that there was specifically any fault.

Cross-examination waived.

WILLIAM D. HILTON.

Examination taken, reduced to writing, and by the witness sworn to, this 19th day of September, A. D. 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

MARCUS L. BRAMAN recalled.

Direct examination by M'r Cozzens:

Int. 1. Have you a correction to make in the testimony given by you on September 10, 1872, in this case; if so, what is it?

Ans. Yes, sir; I came up here this morning to make the correction. I couldn't find M'r Sayles. This testimony I gave here the other day concerning that accident on the road, I have found out by talking with my wife and dates I have in my house that I was mistaken;
1248 that it took place on another train instead of the train I spoke of. My brother—come to talk with my wife and look at receipts I have in the house—left in the fall of 1871 instead of the spring of 1872. I made a large mistake in the dates. I testified it was in the spring; but, instead of that, it was in the fall that my brother left.

Cross-examination by M'r Whipple:

Cr.-int. 1. What was the accident testified to in your previous evidence which you now wish to correct?

Ans. I spoke of some cars being jammed up in the depot.

Cr.-int. 2. Please repeat the accident you testified to which you wish to correct.

Ans. The idea—it was in my head at the time I made the statement—is the accident that happened on the Lower Falls train my brother run on.

Cr.-in. 3. Do you mean the accident of smashing down the platforms referred to in your testimony?

Ans. Yes; I mean at the time the Newton Lower Falls train was switched and we had a smash-up, at the time my brother was turned off.

Cr.-int. 4. Have you seen your brother since you gave evidence here?

Ans. No, sir.

Cr.-int. 5. When were you first reminded of the mistake in your evidence in reference to the accident?

Ans. Well, it was when I talked with my wife. I can't tell you the day it was.

Cr.-int. 6. Did you go and hunt up M'r Sayles in order to make this correction, or did he seek you out?

Ans. No, sir; he has not seeked me out. I came up here and thought I would see him and state the facts as soon as I saw him.

1249 Cr.-int. 7. How did you know he was to be seen here to-day?

Ans. I didn't know he was to be seen here to-day, but I thought I would look and see.

Cr.-int. 8. What made you suppose he would be here to-day, having got through the evidence on the tenth?

Ans. Well, I didn't know that he would be here; but, at the same time, I thought I would make inquiries at the hotel where he stopped, and see if he was here.

Cr.-int. 9. What hotel did he stop at when he was here?

Ans. The Central.

Cr.-int. 10. What hotel did you go to find him this morning?

Ans. The Central Hotel, sir.

Cr.-int. 11. Did he stop at the same hotel this time as he did when he was here on the tenth?

Ans. They told me he did.

Cr.-int. 12. Who told you?

Ans. The porter in the hotel.

Cr.-int. 13. Said he stopped there on the tenth, and stopped there last night?

Ans. No, sir; you are answering one question and asking another.

Cr.-int. 14. Did the porter tell you he stopped there on the tenth?

Ans. No, sir; I knew that.

Cr.-int. 15. Did you learn from the porter that he stopped there also last night?

Ans. Yes, sir.

Cr.-int. 16. On looking over your evidence since you gave it on the tenth, do you think there are any other corrections you ought to make?

Ans. No, sir; not that I know of.

Cr.-int. 17. Have you thought it over since you gave it?

Ans. Well, yes; I think I have.

1250 Cr.-int. 18. In thinking it over, didn't you come to the conclusion that you had really stated to M'r Whipple that you wanted no better brake than the old Springfield on the car No. 124 on the Boston and Albany Railroad?

Ans. No, sir; I never stated that.

Cr.-int. 19. Didn't you frequently volunteer such statements to M'r Whipple when he appeared on that train—on that car?

Ans. No, sir; I never did.

Cr.-int. 20. Do you think there is another brakeman on that train that would corroborate you in any such statement as you have made in reference to the use of the Springfield brake on that car—No. 124?

Ans. Yes, sir.

Cr.-int. 21. Who? Please give us his name.

Ans. Well, there is one man by the name of Stafford.

Cr.-int. 22. Is he now running on the train?

Ans. The same train? Yes, sir.

Cr.-int. 23. Does he operate the brake on No. 124?

Ans. No; I think not.

Cr.-int. 24. What part of the train does he run on?

Ans. I think he runs forward—on the smoking car.

Cr.-int. 25. Between what points?

Ans. Between Boston and Springfield.

Cr.-int. 26. Were you aware at the time 123 and 124 were run in that train—one having the Tanner brake on and the other the Springfield—that both were wearing out iron, one against the other?

Ans. That is what was told me.

Cr.-int. 27. Did you apply the power as faithfully to one car as to the other, when you had it in the rear of the train?

Ans. Yes, sir.

1251 Cr.-int. 28. And yet you say that the Tanner brake held the train as well as a brake ought to, and 124 didn't hold the train at all. Is that your conclusion? Didn't even take the slack of it? That is a fact, is it?

Ans. I believe I testified it didn't take the slack at all times.

Cr.-int. 29. Did it at any time take the slack as well as the Tanner brake?

Ans. No, sir; it did not.

Cr.-int. 30. Were there times when it wouldn't take the slack?

Ans. Yes.

Cr.-int. 31. Was there ever a time when the Tanner brake wouldn't do the same?

Ans. Not that I ever see, when the Tanner brake was in perfect order.

Cr.-int. 32. Was it always in perfect order?

Ans. No, sir. Any brake is liable to be out of order.

Cr.-int. 33. May not the Springfield brake have been out of order when it didn't take the slack of the train?

Ans. It hadn't ought to be out of order week after week, right along, when we had good men to repair it.

Cr.-int. 34. Such you state to be a fact when it was run in connection with the Tanner brake, do you?

Ans. Yes, sir.

MARCUS L. BRAMAN.

Examination taken, reduced to writing, and by the witness sworn to before me this 19th day of September, 1872.

FRANCIS A. DANIELS,
U. S. Commissioner.

1252 **PELEG M. PECKHAM** recalled.

Direct examination by M'r Cozzens:

Int. 1. Will you please state in what year the Tanner brake first went into use on the cars of the Providence and Stonington Railroad?

Ans. I shouldn't want to swear to the exact time. It was either, I think, 1849 or 1850.

Int. 2. While the Tanner brake continued in use on said road, at what part of the centre lever did you make the connections to the windlasses and the truck levers?

Ans. At the ends of the centre levers.

PELEG M. PECKHAM recalled second time.

Direct examination by M'r Cozzens:

Int. 3. You stated the other day that the Tanner brake was continued in general use on the Providence and Stonington road until the company bought the Hodge brake. Was there a period, after they first commenced putting on Hodge brakes, that the Tanner brakes were continued on many of the cars before they got them all off?

Ans. Yes, sir: there was quite a period.

Int. 4. About how long should you think that period was, as near as you can recollect?

A. Well, several years.

Int. 5. State whether during this period there was any difference in the effect of the Tanner brake as compared with the Hodge brake in reference to holding the cars when the brakes were applied.

(Objected to.)

Ans. I couldn't see any, nor didn't hear of any from any of the brakemen.

1253 Cross-examination by M'r Whipple:

Cr.-int. 1. Why did you change the Tanner brake by putting on the Hodge in its place?

Ans. The reason of our changing the Tanner brake for the Hodge brake was to do away with those long rods. It made less friction by having on the Hodge brake.

Cr.-int. 2. From your knowledge of the two brakes, is there no other difference between the two than that one?

Ans. I couldn't see any.

Direct examination resumed:

Int. 6. Which do you think is the easier adjusted and kept up?

Ans. In repair, do you mean?

Int. 7. Yes; keeping adjusted?

Ans. I can't see any difference in the two brakes about that.

Cross-examination resumed:

Cr.-int. 3. Which brake will lose its adjustment quickest, the Hodge brake or the Tanner brake?

Ans. I couldn't see any difference.

Cr.-int. 4. Is the Hodge brake self-adjusting in its nature and character?

Ans. I can't see it is any more so than the other.

Cr.-int. 5. Is the Tanner brake self-adjusting in its character?

Ans. I can't see any difference in the two brakes.

PELEG M. PECKHAM.

Examination taken, reduced to writing, and by the witness sworn to this 19th day of September, 1872, before me.

FRANCIS A. DANIELS,
U. S. Commissioner.

1254 PROVIDENCE, *October* 10, 1872.

WILLIAM CAPRON called and sworn.

Direct examination by M'r Sayles, complainant, in person:

Q. 1. What is your name, age, residence, and occupation?

A. W'm Capron. I am 60 years of age; live in Providence, in the State of Rhode Island, and am a conductor on the Providence and Worcester Railroad.

Q. 2. How long have you been employed upon said road, and in what capacities?

A. Twenty-four years; and two years as baggage-master and brakeman, and the rest of the time as conductor on a passenger train.

Q. 3. While you were brakeman on said road, what kind of brakes were used on the cars?

A. For two years, while I was brakeman, we used single brakes, broke on one end of the car.

Q. 4. What kind of brakes have been used since you have been conductor on said road?

A. They were double brakes.

Q. 5. About how soon after you commenced as conductor were the double brakes applied?

A. In a few years after I commenced as conductor, but I could not state the time.

Q. 6. How did these double brakes work in stopping the trains compared with the single brakes, before the double brakes were put on?

A. The double brakes worked on both ends of the cars, and therefore they had double purchase. I consider the double brake far preferable to the single brake.

1255 Q. 7. Have you noticed any difference in the stopping of trains with the double brakes since they were first introduced on the road, down to the present time?

A. No; I never have. (I never heard it stated by the brakemen that the trains could be stopped any better with the present double brakes than with the first ones.)

(Answer objected to as hearsay.)

Cross-examined by S. M. Whipple:

Cr.-q. 8. What double brakes were first used on the Providence and Worcester road?

A. I could not answer that, as I don't know.

Cr.-q. 9. What double brakes are now used on said road?

A. I don't know.

Cr.-q. 10. Has there been a change made in double brakes upon the passenger cars on your road during the time you have been conductor?

A. I think there has. I think there was a little added to the double brake we now have; if there has been an addition I don't perceive it in braking up the trains, and I have not heard the brakemen under me make any complaint that one was better than the other, and I don't perceive but what the cars "broke up" with one just as well as the other.

Cr.-q. 11. If there is no difference in favor of the double brake you are now using, why did your company go to the expense of buying another patent and change the brakes on your road?

A. I don t know, sir; they did not consult me.

Cr.-x. 12. Do you think the company exercised bad judgment in changing the double brakes?

A. Well, I have always been taught to let well enough alone; the others always worked well, and these work well.

Cr.-q. 13. Do you say that these double brakes do not work any better than the old double brakes?

1256 A. From what I have seen, and from what I have heard from the brakemen, I should not know any difference in the stopping of the trains.

W'M CAPRON.

Subscribed and sworn to before me this 10th day of October, A. D. 1872.

D. B. POTTER,
Notary Public.

SILAS S. MOWRY called and sworn.

Direct examination by M'r Sayles, complainant, in person:

Q. 1. What is your name, age, residence, and occupation?

A. Silas S. Mowry; thirty-four yours of age; residence, Providence, State of Rhode Island; and by occupation, conductor on the Providence and Worcester Railroad.

Q. 2. Do you remember of a car being used on your train some months ago which had on a brake called the Springfield brake?

A. Yes.

Q. 3. How did that brake work?

A. It worked very poor, so much so we did not use it. My little brakeman could not set it up—could not use it—although he could set up a brake as hard as any one. I had a large brakeman also, and he found the same fault. We only had it a few days. I guess it was on there ten days, and I was glad to see it go.

Q. 4. What were these brakemen's names?

A. Leslie Crocker and George Gates.

Q. 5. Do you remember another double brake that was used on passenger car No. 26 for a while last spring; if so, how did that work?

1257 A. I do; that worked first rate. All the brakemen liked it on the train, and with half the labor that brake could be "set up" compared with the one we called the Springfield brake.

Cross-examined:

Cr.-q. 6. How did this brake you speak of compare with the brakes you now use on all your passenger-cars?

A. I liked it, from what I saw, better than these we now have on.

Cr.-q. 7. Who put on this brake you speak of?

A. M'r Sayles.

Cr.-q. 8. Do you consider the brake you are now using, compared with the one M'r Sayles put on, an inferior brake?

A. I don't think it is as good a brake as he put on; I mean by that that it is inferior.

SILAS S. MOWRY.

Sworn and subscribed to before me this 10th day of October, A. D. 1872.

D. B. POTTER,
Notary Public.

A. G. **Sherman** called and sworn.

Direct examination by M'r Sayles, complainant, in person:

Q. 1. What is your name, age, residence, and occupation?

A. A. G. Sherman; conductor on the Providence and Worcester Railroad; am thirty-eight years old, and reside in Cranston, State of R. I.

1258 Q. 2. How long have you been employed on said road, and in what capacity?

A. About 19 years. I was at first a brakeman on a passenger-train for about two years; then as baggage-master and conductor from that time to the present.

Q. 3. What kind of brakes—single or double brakes—were used while you was brakeman?

A. Double brakes.

Q. 4. How did the double brakes, used while you was brakeman, compare with the double brakes now used on said road in stopping trains?

A. I don't know as there is any difference.

Cross-examined:

Cr.-q. 5. Have you operated the brakes now on your cars as brakeman?

A. No, I have not myself.

Cr.-q. 6. How long has the present double brake been on the cars?

A. I don't know, sir.

Cr.-q. 7. Does the present double brake operate as easily and efficiently as the double brake that was on your road when you was brakeman?

A. As far as I know, it does.

Cr.-q. 8. Does it operate better?

A. I don't know as it does.

Cr.-q. 9. Why was there a change of brakes made by your company?

A. I didn't know as there was a change.

Cr.-q. 10. Do you not know that when you was brakeman they used what was called the centre-lever double brake, and after that took them all off and put on the Hodge brake which you are now using?

A. No, sir, I did not.

1259 Cr.-q. 11. If you did not how are you able to draw comparison between the two brakes?

A. Well, I haven't; I don't know any difference I say.

A. G. SHERMAN.

Subscribed and sworn to before me this 10th day of October, A. D. 1872.

D. B. POTTER,
Notary Public.

Testimony on behalf of the complainant, taken at Worcester, Mass.

U. S. circuit court, northern district of Illinois.

Thomas Sayles
vs.
The Chicago and Northwestern Railway Company.
} In equity.

Worcester, Mass., *September 17th*, 1872.

John Moran called and sworn.

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. My name is John Moran; am 42 years of age; reside in Worcester; am a flagman and brakeman on the Boston & Albany Railroad.

1260 Q. 2. About how long have you been a brakeman on the Boston & Worcester, the Western, and the Boston & Albany Railroads?

A. Have been about 16 years on the Boston & Worcester road; have been about 6 years watchman and switchman on the Boston & Albany road at Worcester, and I am on the Boston & Albany road still.

Q. 3. During the time you were a brakeman on these roads what kind of trains did you brake on?

A. On passenger-trains.

Q. Did you at any time while you were on these roads brake on the Boston & New York night express train?

A. Yes, sir.

Q. 5. About what year did you first commence braking on that train, and about how long did you continue?

A. I commenced in 1851 or 1852—I don't remember exactly. I continued on the train about ten years.

Q. 6. During this time what were your duties on this train?

A. I acted as local baggage-master and brakeman.

Q. 7. While so engaged between what points on the road did you run?

A. Between Boston and Worcester.

Q. 8.. In acting as brakeman on that train, at what part of the train were you stationed to apply the brakes?

A. Coming from Boston to Worcester I was braking on the baggage-car; going to Boston I was the behind brakeman—broke on the hind car of the train.

Q. 9. During the time you were on said Boston and New York night express-train as brakeman what kind of brakes were used on that train?

A. I am not certain of the name of the brake they had on when
1261 I went on there; in a short time they got Hodge's brake on.
They took the Hodge's brake off and put a brake on they called the Springfield brake.

Q. 10. About how long, as near as you can recollect, was this Springfield brake kept on those Boston and New York express cars?

A. Some over a year—would not be positive.

Q. 11. Was it then taken off, and, if so, what brake was put on in its place?

A. It was taken off and the Hodge's brake put back in its place.

Q. 12. While this Springfield brake was on these night express cars, did you as brakeman have to apply the brake?

A. Yes, sir.

Q. 13. Please state how these Springfield brakes worked—please answer fully.

A. They worked poorly; that was the cause of them being taken off; we could not do anything with them; could not rely upon them to hold us—to stop us at stations. I had to do the switching of them at the end of the route in Boston, and sometimes I couldn't hold one car with them, and several times I bunted the posts where I had to go in the yard because I couldn't hold them, which I blame the brakes for it. Once or twice I broke a draw bar of the car because I struck the posts so hard. A good many times we run by the stations on the road a quarter of a mile because we couldn't hold the cars up—frequently we run by stations on the road on account of our brake. I don't mean a quarter of a mile; it was in the night time; I couldn't tell; it might have been more and it might have been less than a quarter of a mile, but we often ran by stations.

Q. 14. With which brake—the Hodge or the Springfield—did you have to begin the farthest back to apply the brakes when stopping at stations?

1262 A. With the Springfield brake we had to begin some ways further off than the Hodge's brake in order to stop at the stations.

Q. 15. Did the Springfield brake seem to work alike at all times, or were there differences at times in the way in which it held the trains?

A. No; sometimes it worked better than others, and on a straight line it worked better than on a curve; and it never worked to suit me.

Q. 16. Did you frequently notice when the Springfield brake was applied that the chains would overlap on the windlass shaft; and, if you did, please state what was the effect of the brake as to holding the car or train when this overlapping took place?

A. Yes; I have noticed that it overlapped, and when it overlapped the brake had no command over the car.

Q. 17. Please state whether there were frequently—while you were brakeman on the Boston and New York express car—cars from the Western Railroad, which had single brakes on them, attached to your train.

A. Yes, sir; a good many times; I don't know how often.

Q. 18. When they were attached, at what part of the train were they placed, and between what places did they run?

A. They were placed at the hind end of the train, and they ran from Springfield to Boston.

Q. 19. Did you ever apply the brakes on those single-brake cars when they were in the Boston and New York night express trains?

A. Yes, I have applied them.

Q. 20. Please state with which kind of brake—these single brakes or the Springfield brakes—you could best hold the train.

A. The single brake I preferred.

Q. 21. Which seemed to have the best effect in holding the cars?

1263 A. The single brake, which I felt confident would stop the cars when we had it on the hind end.

Q. 22. About how much of the time while the Springfield brakes were used on the Boston and New York night express trains, did you run on said trains?

A. I think I run right along regular with them, unless I was off sick once in a while.

Q. 23. When the Hodge brake was used on those night express trains how well did it work?

A. They worked good. I felt myself safe with them—and not half the labor there was with the Springfield brake.

Q. 24. Did you feel safe with the Springfield brake?

A. No; I had no confidence in the brake.

Cross-examined:

Cr.-q. 25. In what year were the Springfield brakes put on the New York express line?

A. I don't remember.

Cr.-q. 26. About what year as near as you can recollect?

A. I can't give no idea of the year.

Cr.-q. 27. At the time you were brakeman on the express line on the cars of which the Springfield brake was used, how many stops were you required to make between Boston and Worcester, and between Worcester and Boston?

A. Between Boston and Worcester we made two stops—Providence Crossing and Framingham; and between Worcester and Boston it was uncertain—we might have four or five stops; the regular stops were Framingham and Providence Crossing.

Cr.-q. 28. At what places were you liable to make extra stops other than Framingham and Providence Crossing?

A. Any station on the road we were liable to stop at; there were no specified stops. Passengers that came from New York and wanted to stop at Natick or any station—the conductor informed us and we stopped. 1264

Cr.-q. 29. Were the stations where regular stops were made or stations at which extra stops were to be made, past which you were liable to run by a quarter of a mile or more?

A. We were liable to run by any where, stopping with those brakes.

Cr.-q. 30. Did you frequently run by the station at South Framingham?

A. We ran by a good many times; can't say how many.

Cr.-q. 31. Of the twelve stops made at Framingham which were supposed to be made in one week, how many of these stops should you judge were a quarter of a mile or more?

A. I don't know of any; don't remember of any. I remember that we run by; I didn't measure the distance.

Cr.-q. 32. Do you recollect to have ever stopped at South Framingham with the Springfield brake without running by?

A. Oh, we have stopped there.

Cr.-q. 33. How often did you stop at South Framingham station where you ought to stop?

A. I don't remember.

Cr.-q. 34. Do you think you ever stopped at South Framingham station with the Springfield brake at the place you ought to stop?

A. Oh, yes.

Cr.-q. 35. How often one day with another?

A. I don't know.

Cr.-q. 36. When you stopped at the Providence Crossing did you, as a general rule, stop where you ought to, or did you, as a general rule, run on to the Crossing, with the Springfield brake?

A. Sometimes we stopped; sometimes we run on to it, and sometimes we ran across it.

1265 Cr.-q. 37. Did you ever run onto it with the Hodge brake?

A. I don't remember.

Cr.-q. 38. Do you think you ever run onto it with the Hodge brake?

A. It might be the case that all the brakes were not used, and that we ran onto it; but I don't remember any case.

Cr.-q. 39. Did you ever know a train to run by a station when you had to depend on the Hodge brake?

A. Yes.

Cr.-q. 40. Did you ever know the chain to overlap in the Hodge brake, and thus become ineffectual to hold the car?

A. I never knew it to overlap. I have known it to run off the worm.

Cr.-q. 41. How does this running off the worm affect the brake?

A. It disables the connection-rod. It is easily remedied, though.

Cr.-q. 42. What is the remedy?

A. Shortening the chain, or taking up the connection-rod.

Cr.-q. 43. Is this remedy applicable to the Springfield brake?

A. I don't know. It is a different rigging.

Cr.-q. 44. Did the chain on the Springfield brake always overlap when you attempted to apply the brake?

A. No; not always.

Cr.-q. 45. Did you consider the brake in order when the chain did overlap?

A. It was about the order we always had it.

Cr.-q. 46. When you ran by stations a quarter of a mile or more, what did you have to do?

A. When we had ladies to get out, we backed to the station, and when we had men we let them out where we were, and went on.

1266 Cr.-q. 47. On your arrival in Worcester, and also in Boston, was the train generally in on time, or behind time, when you had the Springfield brake?

A. We were pretty generally on time in our arrival in Worcester, and pretty generally on time in Boston—sometimes ten or twelve minutes late in Boston. I don't know how often.

Cr.-q. 48. When you were late in arriving in Boston, it was in consequence of having the Springfield brake, was it not?

A. I don't know.

Cr.-q. 49. Do you think having the Springfield brake had anything to do with your arriving late at Boston sometimes?

A. I don't know.

Cr.-q. 50. You speak of the Springfield brake as not holding as well on a curve as on a straight track. Where are the curves located between Worcester and Boston on which you have had occasion to brake, and thus observe the difference?

A. There are a good many curves. There is a curve going to Westboro', a curve going to Cordaville, and there is a curve going to Framingham. I braked on all those curves.

Cr.-q. 51. Any other curves on which you have had occasion to brake with the Springfield brake; if so, name them, and what was the result of your observation as to the brake holding on all of them you have named?

A. Grafton, Southboro', Wellesley, Grantville, Rice's Crossing, Charles River, Auburndale, Cottage Farm. I don't remember the result of how the brake worked on all of them.

Cr.-q. 52. Do you remember how the Springfield brake worked on any of the curves at stations named by you?

A. I can't remember just now; I can't set any time.

1267 Cr.-q. 53. Did you really observe any difference whether the train was running on a straight track or a curve in the holding of the Springfield brake?

A. Yes; the brake worked harder on a curve.

Cr.-q. 54. When it worked harder did it hold better?

A. I don't think it did.

Cr.-q. 55. Did it hold at all?

A. Sometimes it held some, and sometimes it wouldn't hold the car itself from the car ahead of it.

Cr.-q. 56. Did you ever know the Hodge brake to be in a condition that it couldn't take the slack of the train or hold the car ahead of it.

A. Yes; I have known it, when it was broken, not to take the slack.

Cr.-q. 57. Did you ever know the Springfield brake to be broken?

A. Yes; I think I have.

Cr.-q. 58. Did you ever know the Hodge brake, when it was not broken, in a condition that you couldn't take the slack of the train with it?

A. No; I don't remember.

Cr.-q. 59. Why were cars with the single brake on attached to express-line trains?

A. To accommodate the public who wanted seats.

Cr.-q. 60. You felt perfectly safe, didn't you, in running this express-train with the Springfield brake when you had a car on with the single brake?

A. I felt as if we could stop at a station when we wanted to stop.

JOHN MORAN.

Subscribed and sworn to this 17th day of September, A. D. 1872, before me.

W'M B. HARDING,
Justice of the Peace.

1268 EDWARD A. WOOD called and sworn.

Direct examination by M'r Cozzens:

Q. 1. State your name, age, residence, and occupation.

A. Edward A. Wood; am 28 years of age; reside in Paxton, Mass.; am at present a teamster.

Q. 2. Have you recently been employed on the Boston and Albany Railroad as a brakeman; if so, when did you leave said road?

A. I have; I left the road the first of last June—either the first day of June or the last day of May.

Q. 3. How long were you employed on said road as a brakeman?

A. One year.

Q. 4. What kind of trains did you brake on during that time?

A. Passenger-trains.

Q. 5. Was one of these passenger-trains a train which had on its cars a brake called the Springfield brake?

A. Yes, sir; after some time last winter.

Q. 6. Who was the conductor on this train that had the Springfield brakes on, and how long did you brake on said train?

A. J. B. Adams was the conductor. I broke on the train from the time it was put on till last June.

Q. 7. At what part of the train were you stationed to apply said Springfield brakes?

A. At the forward end.

Q. 8. How did said Springfield brakes work while you braked on that train?

A. They did not seem to hold, and worked hard.

Q. 9. Was there every other day, on the train that ran alternately with that train, any other kind of brake; if so, what kind?

A. Yes, sir; the Hodge brake?

1269 Q. 10. Did you brake on this train on the days when the Hodge brake was used?

A. Yes, sir.

Q. 11. With which brake—the Springfield or the Hodge—did you have to begin the farthest back when applying the brakes to stop the train?

A. The Springfield.

Q. 12. About how much further back did you have to begin to apply the Springfield brake than you did the Hodge?

A. Nearly as far again from the station.

Q. 13. State whether, on the days when the Springfield brake was used, the train would sometimes run by stations when attempting to stop?

A. It would, sometimes.

Q. 14. State what you found to be the fact, when the Springfield brake was used, as to whether it could be depended upon, as a general thing, to hold the train properly?

A. It could not.

Q. 15. State whether you ever noticed that one of the chains of the Springfield brake would sometimes overlap on the eye of the windlass-staff so that the two chains could not be pulled equally when the brake was applied?

A. I have noticed it overlap.

Q. 16. When this overlapping took place, what was the effect as to holding the car?

A. It would not hold.

Cross-examined:

Cr.-q. 17. How many cars composed the trains upon which M'r John B. Adams was conductor, and how many brakemen were allowed to operate the brakes on said trains?

1270 A. There were five cars on the train in the winter, from Springfield to Albany, and in the summer there was six. There were two brakemen allowed on the trains to operate the brakes.

Cr.-q. 18. Who acted as brakeman with you while you were on said trains?

A. Henry F. Taylor.

Cr.-q. 19. How long were the chains of the Springfield brake which wound around the brake-staff on the cars of which you operated the brakes?

A. I don't know.

Cr.-q. 20. In operating these brakes, did the hook of the rod at the end of the chain come up against the brake-staff so as to shut off the power from the wheels?

A. No, sir.

Cr.-q. 21. Was there always chain enough so that you could put your whole force on the brake and not take up all the chain?

A. Yes, sir.

Cr.-q. 22. About how many revolutions of the brake-wheel could you make before the brake was fully set?

A. I could not tell.

Cr.-q. 23. How many times do you think the chain was wound around the brake-staff in applying either the Hodge or Springfield brake?

A. I don't know, sir.

Cr.-q. 24. How many times should you judge, from observation?

A. I couldn't tell. It is some time since I used it.

Cr.-q. 25. Do you think it requires three or four revolutions of the brake-wheel to operate the brakes in question?

A. I should think about three.

Cr.-q. 26. In your judgment, did it take, as a general rule, about three revolutions to set firmly the Springfield brake?

A. I should think so. I never counted them.

1271 Cr.-q. 27. Did the Springfield brake, at any time you operated it, seem to hold the car as a car ought to be held in stopping it?

A. Sometimes it would hold.

Cr.-q. 28. Did the train ever run by a station with the Hodge brake?

A. Sometimes; but not very often.

Cr.-q. 29. When the trains with the Springfield brake on ran by, what part of the length of the train did it pass the point where it ought to stop?

A. Sometimes more, sometimes less.

Cr.-q. 30. May not the Springfield brake have been out of order at times when it allowed you to run by the station?

A. It never was, to my recollection.

Cr.-q. 31. Then, according to your recollection, it was never out of order. Is that what you mean?

A. Yes, sir; while I was brakeman; the brakes I handled.

Cr.-q. 32. Did you ever know the Hodge brake to be out of order so as to be ineffectual in stopping the trains properly?

A. No, sir.

Cr.-q. 33. Are not all brakes liable to be out of order from various causes?

A. Yes, sir.

Cr.-q. 34. But I take it, from your experience with the Springfield brake, that it was never out of order. Is that so?

A. It might have been. I might not recollect it.

Redirect:

Q. 35. You have spoken of the number of times the windlass-wheel was turned to apply the Springfield and Hodge brakes. May it have been less than three times that it was turned?

A. Yes, sir; it might have been. It is something I never counted or took any particular notice of.

1272 Recross:

Cr.-q. 36. How many turns of the windlass-wheel did you have to make when the chains overlapped, as you have stated that they did?

A. I have seen them catch on the eye the first time round. I couldn't tell how many turns after that; but in a short time I could pull it no further.

Cr.-q. 37. When you could pull it no further, was it not from the fact that there was no more chain to wind on the staff?

A. No, sir.

Cr.-q. 38. Did you take particular notice and observe that there was still more chain to wind on the staff when you could pull the chain no further?

A. I did, sir, as on several occasions I have got down on the platform and step and looked under.

Cr.-q. 39. Was the brake still on when you got down and looked under?

A. Yes, sir.

Cr.-q. 40. Had you, before looking down, wound the chain upon the staff at least twice round it in applying the brakes?

A. I should say not.

Cr.-q. 41. Do the chains of the Springfield brake wind at least once round the staff in putting the brakes firmly on?

A. Yes, sir.

Cr.-q. 42. Do they twice round?

A. I couldn't say.

Cr.-q. 43. What do you think about it?

A. I couldn't tell how many times round.

Cr.-q. 44. Do you think there would be much overlapping of the chains when the slack and wear of the brake is so small that the brake could be firmly set inside of two turns of the brake-wheel?

A. I do.

1273 Cr.-q. 45. In the overlapping of the chains, did one chain ride down upon the brake-staff and overlap the other chain?

A. No, sir; it did not.

Cr.-q. 46. Did the upper chain in any way come in contact with the lower chain?

A. Not round the brake staff.

Cr.-q. 47. In this matter of overlapping the chains, did you observe anything more than that the first link of one of them lopped down a little before the chain went direct round the windlass staff?

A. Yes, sir.

Cr.-q. 48. What more?

A. The chain would wind round and catch on the eye by one of the links.

Cr.-q. 49. Did this always happen when you tried to set up the Springfield brake?

A. No, sir; not always.

Cr.-q. 50. How did the brake hold when it did not so happen?

A. It would hold some, but not so well as the Hodge brake.

EDWARD A. WOOD.

Subscribed and sworn to this 17th day of September, A. D. 1872, before me.

W'M B. HARDING,
Justice of the Peace.

LORENZO HARDING called and sworn.

Direct examination by M'r Cozzens:

Q. 1. State your name, age, residence, and occupation?

A. Lorenzo Harding; am 63 years of age; reside in Worcester, Mass. I am a car builder by occupation. At present I am engaged in repairing and taking care of passenger-cars at the Foster street station for the Boston and Albany Railroad. 1274

Q. 2. How long have you been employed on the Boston and Worcester Railroad—now the Boston and Albany Railroad?

A. About 18 years; I can't state the time exactly.

Q. 3. What have been your duties on said road during that time?

A. Principally in taking care of and repairing cars, and inspecting them when running through from Springfield to Boston. Before the roads were consolidated—making the Boston and Albany road—we inspected every car that came off of the Western road before it went on to the Boston and Worcester road.

Q. 4. Were you inspecting and taking care of passenger-cars on the Boston and Worcester Railroad 15 years ago?

A. Yes, sir.

Q. 5. Among these cars were there the cars which formed the passenger express lines between New York and Boston?

A. Yes, sir. We had to inspect every car that went over the road. No car went over the Boston and Worcester road until it had been inspected.

Q. 6. How much of the time did you yourself attend to this inspection of the cars at the time referred to—about 15 years ago?

A. Every day and every other night, except once in a while when I was away, which was not often. In the whole time I have been on the road I have not been away a month.

Q. 7. Do you remember about 15 years ago that the cars of the express passenger lines between New York and Boston, running over the

Western and the Boston and Worcester roads, had on them a brake called the Springfield brake?

1275 A. I remember a brake by that name; what time it was put on I can't tell. I know the brake very well. The brake was on those express-cars.

Q. 8. Did you inspect those cars while they had this brake on them?

A. Yes, sir.

Q. 9. About how long did that Springfield brake continue in use on those cars?

A. I could not tell how long, but they were on quite a number of years. The time they were on was something I never took notice of.

Q. 10. Was it within the line of your regular duties as one of the inspectors of the cars running over the Boston and Worcester road at the time these Springfield brakes were on those express-cars, to know what was the opinion entertained about them by the persons employed on the trains on which they were used; and, if so, what was such opinion?

A. It was. The general opinion was that they were not good for anything; they were not a good brake. It was not as good as a single brake on one set of wheels; that is, on one truck; that was my opinion at the time. I have always thought so.

Cross-examined:

Cr.-q. 11. All the time you were inspector of cars, and while the Springfield brake was in use on the express-line, did you or not ever see any of the wheels slide under the brakes when the train came into the station?

A. I don't know as I ever did.

Cr.-q. 12. Did you ever see the wheels slide with the application of any brake when the train came into the station?

A. I don't think I ever did. I have no recollection of it.

Cr.-q. 13. Did the train frequently run by the station with the Springfield brake on?

1276 A. No, sir. It was seldom that any train ran by the station; they might have run by the length of the engine, or some distance. They generally stopped at one place, or came very near, but they might have run by.

Cr.-q. 14. Would the train be as likely to run by with any other brake as the Springfield brake?

A. I don't think it would make any difference what kind of a brake they had on. The engineer has the train under control when he comes in there, and can hold the train at any time at that place where I have been stationed. That is my judgment about it. The track would sometimes be slippery, and he might not be able to hold the train, but he was not under much headway when he came in there.

Cr.-q. 15. By what means would the engineer hold the train?

A. The engineer would reverse the engine if the train was going by.

Cr.-q. 16. Does the engineer reverse his engine at the present time, if the train is going by?

A. The engineer is not apt to reverse his engine unless he thinks it necessary.

Cr.-q. 17. After the Springfield brake was taken off and another brake put on, did the engineer reverse his engine when he was likely to run by the station while you were inspector?

A. Probably he would if he was going by. I have not been there to inspect cars for four or five years, and I don't know when the brake was taken off.

Cr.-q. 18. Was the brake on the express line cars some five or six years ago when you left inspecting cars at the Western railroad station?

A. That I couldn't tell you, whether it was on at that time or not.

Cr.-q. 19. You say you "know the Springfield brake very well." Will you please describe its construction?

1277 A. I am hardly able to do that. It is a complicated thing. I know the brake very well. I should know it if I should see it.

Cr.-q. 20. Supposing you should see a brake with four levers—one on each brake-bar—the levers being properly connected one with the other, and with the windlasses of the car—would you call such a brake a Springfield brake?

A. The Springfield brake had four levers, and so do other brakes. Every double brake has four levers that I have seen—except that there is a kind that has three levers, one of them under the centre of the car.

Cr.-q. 21. Did the Springfield brake have two equalizing levers under the body of the car?

A. I have already said that I can't tell the construction of the brake, but I should know it if I should see it.

Cr.-q. 22. Question repeated.

A. That is a thing that I can't tell you.

Cr.-q. 23. Did you ever apply the Springfield brake for the purpose of stopping the train?

A. No, sir; I had no occasion to do that.

Cr.-q. 24. What is the ground of your opinion for the statement that the Springfield brake was a poor brake?

A. The ground of my opinion is that it is complicated, that it had more length of chain than any brake should have, and that the brakemen couldn't work it as quick, and that they couldn't apply the power to it as quick, as to a single brake.

Cr.-q. 25. Did the Springfield brake have one or two chains attached to the windlass for operating the same?

A. It must have had two—one at each end of the car. It did have.

Cr.-q. 26. Did it have one or two chains attached to each brake-staff?

1278 A. That I couldn't tell you.

LORENZO HARDING.

Subscribed and sworn to this 17th day of September, A. D. 1872, before me.

WILLIAM B. HARDING,
Justice of the Peace.

HALFORD W. FENNER called and sworn.

Direct examination by M'r Cozzens:

Q. 1. State your name, age, residence, and occupation.

A. Halford W. Fenner; am 47 years of age; reside in Worcester, Mass.; am an engineer at present; I run a locomotive engine.

Q. 2. On what railroad are you employed?

A. The Boston and Albany.

Q. 3. How long have you been employed on that road, including the time when it was called the Western road?

A. A little over 18 years.

Q. 4. What train are you running on that road at the present time?

A. The day express—between New York and Boston.

Q. 5. When you first went on to the Western road, what train did you run?

A. The Boston and New York night express.

Q. 6. For how long did you run the night express?

A. For about 11 and one-half years.

Q. 7. What year did that 11 and one-half years begin?

A. In 1854.

Q. 8. Between what points did you run the night express during this 11 and one-half years?

1279 A. Worcester and Springfield.

Q. 9. While you so ran this night express-train, do you remember a brake being used on it known as the Springfield brake?

A. I do.

Q. 10. About how long was the Springfield brake used on that train?

A. I should say somewhere in the neighborhood of a year; I can't swear as to the exact time.

Q. 11. What brake was used on that train just before the Springfield brake was put on it?

A. I think it was the Hodge brake.

Q. 12. While the Springfield brake was used on that train, how did it work?

A. The brake did not give good satisfaction; it worked poorly. We could not depend upon it always. We averaged a good deal poorer stops while the brake was in use than we did before or after it was used. I was afraid of the brake. In coming into stations I had to give the brakemen more lee way—shut off the steam further away from the station—and very often we would run by at that. A part of the time we had a Western Railroad car on the hind end of the train with a single acting brake; when that car was on, we could make better stops than we could without it, though it was one more car with the same number of brakemen—which was three and sometimes four, according to the number of cars.

Q. 13. After the Springfield brake was taken off of these night-express cars, what brake was put on in its place?

A. The Hodge brake.

Cross-examined:

Cr.-q. 14. Any more brakemen employed on this train when the Hodge brake was used?

A. No, sir.

Cr.-q. 15. Was there any less number?

1280 A. No, sir. The law compelled them to carry a brakeman for every two cars—for all trains running over 30 miles an hour.

Cr.-q. 16. What was the average speed of this express-line train when it had the Springfield brake on it?

A. I should call the average time at that time about 32 miles an hour. Some parts of the road—our road being a heavy graded road—we run at a speed of 50 miles an hour. Since and before the Springfield brake was used the average time has been faster and slower.

Redirect:

Q. 17. State whether while the Springfield brake was used on the night express-train, you frequently found fault with the brakemen for not holding the train well; and what, if anything, did they say the reason was they could not hold it?

A. My finding fault with the brakemen was of frequent occurrence.

They said the brakes were good for nothing, and could not hold the train, and that the brakes wouldn't brake twice alike.

Recross:

Cr.-q. 18. Did you ever complain to the brakemen because they didn't hold you with the Hodge brake?

A. I have, but not very often.

Cr.-q. 19. Is your not being held well always attributable to the brakes, and not to the men who operate them?

A. It is to both—both the brakes and the men.

Cr.-q. 20. If brakemen neglect their duty, will any brake, however good, hold you as you ought to be held?

1281 A. If brakemen neglect their duty and don't apply the brake, it is no brake, and one brake is as good as another.

Cr.-q. 21. May not the brakeman apply the brake and still in such a manner as not to effectually stop the train, however good the brake may be?

A. I should say not, if they applied the brake properly.

Cr.-q. 22. What would you call applying the brake properly?

A. A man putting his whole strength to the windlass and winding up the chain hard as he could without sliding the wheels.

Cr.-q. 23. Anything short of this, would it, in your judgment, be a neglect of duty?

A. In certain cases it would. There are cases, when coming into stations, where the forward brakeman don't brake as hard, and don't intend to, as the rear brakeman. The rear brakeman takes the slack of the train first; the forward brakeman then regulates the speed into the station. In that case the forward brakeman would not exert his whole power on the brake unless the train was likely to run by the station.

Redirect:

Q. 24. On the night express train, while the Springfield brake was used, did the same men act as brakemen before and after it was used as did so while it was used?

A. I could not state positively whether all the same men were on the train or not. Two of them were, both before and after, and while the Springfield brake was used.

Q. 25. Before and after the Springfield brake was used, did you, except rarely, have any trouble in being held by the brakes?

A. Very little.

Q. 26. As a general thing, how was it while the Springfield brake was used?

1282 A. The stops were poor, and we had considerable trouble, as I have said before.

Recross:

Cr.-q. 27. What do you call a poor stop?

A. If I am running at the rate of 40 miles an hour, and call for brakes, and the train runs a mile before stopping, I should call that a pretty poor stop—which is the stop I have made with the Springfield brake.

Cr.-q. 28. On what kind of a grade?

A. A descending grade, 50 feet to the mile.

Cr.-q. 29. Where located?

A. In the town of Charlton.

Cr.-q. 30. At any station; if so, at what station?

A. No; between stations.

Cr.-q. 31. Why did you call for brakes between stations?

A. Because of a disabled engine.

Cr.-q. 32. Do you know that the train ran a mile under the brakes?

A. I do.

Cr.-q. 33. How do you know it?

A. By the mile-posts on the road.

Cr.-q. 34. Do you know that each brakeman put on the brake the best they could from the time you called for brakes to the time the train stopped?

A. Personally I don't; all I know is what they said. They said they put the brakes on the best they could—the brakemen and the conductor too. They so reported to me.

Cr.-q. 35. Do you think the brake was in order at that time?

A. It was supposed to be when we left Springfield that night.

1283 Cr.-q. 36. How far do you think the train would have run had the single brake been on each car, and as effectually applied by the brakeman who ran on that train at the time?

A. The train ought to have been stopped in a good deal less distance than that. How quick the single brake would have stopped it I can't tell.

Cr.-q. 37. In how much less than a mile do you think the train ought to have been stopped with the single brake?

A. It ought to have been stopped in less than one-half of a mile.

Cr.-q. 38. What is the Springfield brake but a combination of two single brakes—or the brakes of both trucks—with each other and with the windlass of the car?

A. I don't see as there is much difference between the Springfield brake and the brake you describe.

Redirect:

Q. 39. Was this disabling of the engine you speak of in the daytime or night?

A. In the night.

Q. 40. When an engineer on an express train is running between stations at night, and calls for the brakes, is it or not expected on any railroad that the brakemen will do the best they can—not knowing what the trouble may be—to apply the brakes so as to stop the train in the shortest possible distance?

A. Yes; it is expected that they will do their duty first, and look out afterwards to see what the trouble is.

Recross:

Cr.-q. 41. Which do you think a brakeman at forty dollars a month would be likely to do first, in case of an emergency—to look out for himself and then apply the brakes, or apply the brakes and then look out for himself?

1284 A. At the rate of forty dollars a month, if he wanted to earn it afterwards, he would put the brakes on first, and then look out to see what the trouble was—for putting on the brakes would be his only salvation and that of the train. If he did not apply the brakes when he was called upon, but looked out first to see what the matter was and then applied the brakes, I should not consider him a fit man for a brakeman on any train whatever.

Cr.-q. 42. Do you think any brakeman who should look out before applying the brakes and see a collision ahead, that he would then apply the brakes and be crushed, or would he jump for dear life?

A. I think he would apply the brakes if he was a man—save his own life and the lives of the rest of the people in the train.

Cr.-q. 43. Do you know of any heroes among brakemen?

A. A good many.

H. W. FENNER.

Subscribed and sworn to this 17th day of September, A. D. 1872, before me.

W'M B. HARDING,
Justice of the Peace.

SEPTEMBER 18TH, 1872.

JAMES P. PIERCE called and sworn.

Direct examination by M'r Cozzens:

Q. 1. State your name, age, residence, and occupation.

A. James P. Pierce; am 63 years of age; reside in Worcester, Massachusetts; am a carpenter by trade.

1285 Q. 2. Were you ever in the employ of the Western Railroad Company—now Boston and Albany; and if so, about how long were you employed by them, and when did you leave their employ?

A. I was in their employ about 28 years. I left their employ three years ago last June.

Q. 3. While employed by them at what place were you employed, and what were your duties?

A. I was about three years at Springfield, and the rest of the time at Worcester. My duties were to repair and inspect the wood-work and general repairs of cars—temporary repairs.

Q. 4. Do you remember, while you were engaged in these duties at Worcester, that there was a brake called the Springfield brake used for a while on the cars of the express trains running between Boston and New York over the Western road?

A. I do remember.

Q. 5. Was it a part of your duty to inspect and look after the cars of those express trains during the time that said Springfield brake was on them?

A. Yes.

Q. 6. About how long, according to your recollection, was that brake used on said cars?

A. It was a short time. I couldn't state any definite time. It might have been a year—might have been two.

Q. 7. Was it in the line of your duty, as inspector and repairer of cars at the time this brake was used, to know what was the opinion about it held by the men on the Western railroad who ran on the train on which it was used; if so, what was their opinion of it?

A. Yes; they used to come to me about it. They complained about it that it was not good for anything—that it wouldn't hold. That was the general report about the brake—that it wasn't good—was a bad brake.

Q. 8. Was there any other man who helped you or worked with you in repairing or inspecting cars at this time; if so, who was it?

1286 A. M'r Boyden; but he was not always there, but he was at the shop.

Q. 9. About the time the Springfield brake was used on the express cars, do you know of orders being given by the officers of the Western railroad in reference to not using double-acting brakes on the cars running over that road; if so, what is your knowledge about it, and what were the orders?

A. Yes; I know of such orders. I know it from M'r Boyden and M'r H. P. Nichols. I think M'r Nichols gave me orders. He was general station agent at Worcester. The order was to unhitch the chains so that the double-brake couldn't be used. I mean the double-acting brakes.

Q. 10. State anything within your knowledge about what the men used to do to the double-acting brakes in carrying out those orders.

A. We used to unhitch the chains. We did it for a while, but I think not very long.

Q. 11. After the chains were unhitched, did the brakemen belonging to the train frequently do anything to them; if so, what?

A. The brakemen used to say that they hitched them up again, and I think I have seen them after they were hitched.

Cross-examined:

Cr.-q. 12. What kind of a brake was left on the car after the chain was unhitched?

A. None at all; that is, it couldn't be used while the chain was unhitched from the lever—to be more definite.

Cr.-q. 13. What was the name of the brake you had orders to unhitch the chain, and thus, as you say, entirely destroy the operation of the brake?

A. The Hodge brake.

Cr.-q. 14. Were the operatives of the train expected to run the same and stop it without brakes?

1287 A. That I don't know.

Cr.-q. 15. Did they run the trains in this manner?

A. They did; if they didn't rehitch the chains.

Cr.-q. 16. Did you understand that M'r Nichols, who gave the order, expected that the trains would be run with the brakes unhitched, as you have stated?

A. Yes, I think he did; he expected the order to be carried out if he gave it. I am not certain that he gave the order. I think either M'r Nichols or M'r Boyden gave the order, and I supposed the order came from headquarters.

(The supposition of the witness objected to by the counsel for the complainant.)

Cr.-q. 17. To what extent was the Springfield brake applied to the cars of the Boston and New York Express Line; that is to say, was it applied to a part of them or to all of the cars composing that line?

A. A part, I think.

Cr.-q. 18. What brake was on the remainder of the cars which did not have the Springfield brake on?

A. I think it was the single brake.

Cr.-q. 19. Are you quite sure that the single brake was used on any of the cars of that line while the Springfield brake was in use on the same train?

A. I am not sure about it.

Cr.-q. 20. Did not all the line cars have the Springfield brake applied to them at the time testified to by you?

A. I think not; I am not certain. I think only a part of them.

Cr.-q. 21. Did a part of them have the Hodge brake applied to them at the time the Springfield brake was in use on that line?

A. I am not certain about it. I rather think the Hodge brake was put on afterwards.

1288 Cr.-q. 22. Did you inspect the cars of this line every day, as a general rule, while the Springfield brake was in use on it?

A. As a general rule, I did. Some days I did not.

Cr.-q. 23. How many trains of this line running both ways, did you or M'r Boyden inspect in twenty-four hours?

A. Four trains, I think.

Cr.-q. 24. As a general thing, what number of cars composed each train?

A. I think about seven; might be eight, and sometimes more.

Cr.-q. 25. Of these seven or eight cars which composed each of the four trains, how many cars in each train do you think had the Springfield brake on?

A. I couldn't say.

Cr q. 26. How many according to your best recollection?

A. I couldn't make any statement about how many.

Cr.-q. 27. Do you think there was one car in each train that had the Springfield brake on it?

A. I couldn't state anything about that. Some days there might not have been any of those cars in those trains.

Cr.-q. 28. Can you remember that the Springfield brake was on any of the cars of the New York and Boston Express Line?

A. I think I do. I think it was on some of them.

Cr.-q. 29. How many of them?

A. That I don't know.

Cr.-q. 30. Was it on two cars?

A. I think it was.

Cr.-q. 31. Was it on three cars?

A. I couldn't say; it might have been on two or three or four. Don't know as I ever knew how many it was on.

1289 Cr.-q. 32. And yet you inspected those cars almost every day for a year, and yet don't know what brakes were on the cars; is that so?

A. I don't know now. I have forgotton.

J. B. PIERCE.

Subscribed and sworn to this 18th day of September, A. D. 1872, before me.

W'M B. HARDING,
Justice of the Peace.

CHARLES G. PARKER called and sworn.

Direct examination by M'r Cozzens:

Q. 1. State your name, age, residence, and occupation.

A. Charles G. Parker; am 49 years of age; reside in Worcester, Mass.; am a grocer.

Q. 2. How long have you been a grocer?

A. Ten years.

Q. 3. Were you ever in the employment of the Boston and Worcester Railroad Company? If so, in what capacity, and about when did you commence to be employed by them?

A. I was employed by the Boston and Worcester Railroad in the capacity of brakeman on a passenger train. I was two years on the first train in the morning, running from Worcester to Boston; then I went on the 9.45 train from Worcester to Boston—it connected with the first train that left Springfield over the Western road in the morning—these were the trains I ran on, except that occasionally I ran on the Albany express, so called, and on the New York express, which left Boston about 3 o'clock or 2½ o'clock in the afternoon. I first commenced to work on the road about March, 1854.

1290 Q. 4. In any of these trains upon which you so ran as brakeman, was there at any time a car from the Western Railroad which had on it a brake called the Springfield brake?

A. There was.

Q. 5. Which train did this car run in?

A. It ran in the train that I connected with at 9.45.

Q. 6. Between what places did you run on this train that had this car on it?

A. From Worcester to Boston, and return.

Q. 7. About how long was this car with this brake on it run?

A. I could not be positive, but it was not far from two years.

Q. 8. How many chains winding round the windlass staff at each end of the car did that brake have?

A. It had two.

Q. 9. For about how much of the time while that brake was used on that train did you run as brakeman on the train?

A. I ran as a brakeman on that train all the time that brake was used, except that occasionally I acted as baggage-master.

Q. 10. Did you as brakeman on that train have to apply that Springfield brake on that car?

A. I did.

Q. 11. How did that brake work?

A. It did not work well.

Q. 12. Will you please state what were the difficulties you had with it; what were the defects of it?

A. One great trouble with it was that the chains were very loose—there was two much slack; in winding up the brake the chains would overlap—consequently you lost your power of the brake. In winding the chains around the windlass, the windlass at that part became larger —in winding—by the several turns of the chain overlaying the first turn, consequently you lost your power. One other trouble was the
1291 chain being so slack it would drop under the step in which the lower end of the windlass-shaft was placed, and you couldn't apply the brake at all when the chain catched under there. I don't wish you to understand that it worked so all the time—that is, catched underneath—but it did occasionally. I repeatedly asked our car-inspector in Boston—I think it was Hutchins at that time—to take up the slack-chain, as I lost a great amount of time in turning the brake. He said that it couldn't be done and have the brake work well.

Q. 13. As a general thing, how did this Springfield brake work as to holding the car or train?

A. It did not work well. It did not hold the train—not so well as the old single brake.

Q. 14. Were there cars also run in that train coming from the Western road, which had on them the old single brake?

A. There were.

Q. 15. And could you hold the train better with those single brakes than you could with the Springfield brakes?

A. I could.

Q. 16. While you braked on that train, at what part of the train were you stationed?

A. One way over the road I was stationed between the Boston and Worcester Railroad cars and the Western—broke on both cars. It was

my duty to separate the cars as we came into Worcester—this was coming from Boston to Worcester—and in going from Worcester to Boston, perhaps half of the time I was stationed on one of the Western Railroad cars, and the other half of the time on the Boston and Worcester cars. I always preferred to brake on the Boston and Worcester cars because they had the Hodge brake. I could hold the the train better, and not run by the station so often as we did when I was braking on the Springfield brake. I considered the Springfield brake perfectly worthless. In case of an accident, I should not consider it safe at all. In coming out of Boston on that train we ran by stations one-half of the
1292 time, and had to back up again, until we got up to Framingham. They used to say to us that we didn't brake well; M'r Witherbee, the engineer, said so. I told him if he would give us the Hodge brake on all the cars, we could hold the train. He said he couldn't make his time over the road in shutting off steam so far from the stations, and he had to reverse his engine.

Q. 17. When this running by the stations occurred, what brakes were your trying to hold the train with?

A. I was using one Springfield brake and one Hodge brake.

Cross-examination:

Cr.-q. 18. How many cars composed this train?

A. We ran three passenger-cars and one baggage-car—Boston and Worcester cars—and two long passenger-cars, and one long baggage-car from the Western road; making seven cars in all. But many times we had on more than that, but this was the usual train.

Cr.-q. 19. How many brakeman were allowed to this train?

A. There were two brakeman to the Boston and Worcester cars, and one came down on the Western. We had two baggage-masters who broke their own cars; one on the Boston and Worcester part, and the other on the Western part of the train.

Cr.-q. 20. How many of the cars of this train had the Hodge brake applied to them?

A. The Boston and Worcester cars; three passenger and one baggage car.

Cr.-q. 21. What brakes were applied to the three cars that belonged to the Western road?

1293 A. One passenger-car had the Springfield brake; the other passenger-car and the baggage-car had the common single brake, so called.

Cr.-q. 22. Was this Springfield brake a double brake—that is to say, did it apply the power of the brakemen to both trucks of the car and from either end?

A. It was got up for that purpose. It was so called a double brake. Sometimes I thought it didn't act on either end. I think it was got up to evade the Hodge brake. I don't say it was—I merely supposed so.

C. G. PARKER.

Subscribed and sworn to this 18th day of September, A. D. 1872, before me.

W'M B. HARDING,
Justice of the Peace.

JONATHAN G. WITHERBEE called and sworn.

Direct examination by M'r Cozzens:

Q. 1. State your name, age, residence, and occupation.

A. Jonathan G. Witherbee; am 62 years of age; reside in Worcester; am a keeper of a hotel.

Q. 2. Were you ever employed on the Boston and Worcester Railroad; if so, in what capacity?

A. I was employed on the Boston and Worcester road 19 years—the last 17 of them as a locomotive engineer.

Q. 3. Do you remember what year you went on to the road and what year you left?

A. I left the road 13 years ago last August. It was 19 years before that, that I went on to the road.

1294 Q. 4. While you were locomotive engineer there, what trains did you run on?

A. I run on most all the trains; the last seven years I run on the accommodation train between Worcester and Boston. The first two years the train left Worcester at 7 o'clock a. m. The last five years it left at 9.30 a. m.

Q. 5. Did the train last spoken of connect with a train coming from Springfield over the Western road?

A. Yes, sir.

Q. 6. Do you know M'r Charles G. Parker; and if so, state whether he used to run on this train last spoken of as brakeman?

A. I do know him; he did run on this train as brakeman.

Q. 7. Do you recollect of there being in that train one car which came from the Western Railroad and which had on it a brake called the Springfield brake?

A. Yes, sir.

Q. 8. About how long was that Springfield brake used on that car?

A. I should think about a year, or a little more.

Q. 9. How much of the time while that car with that brake was in that train did you run the train?

A. Most of the time.

Q. 10. Do you remember how many chains winding round the windlass staff at each end of the car that brake had; if so, how many?

A. It had two.

Q. 11. How did that brake work as to holding the car or train when it was applied?

A. It worked bad; there was not much dependence to be put upon it.

Q. 12. What kind of brakes were there on the other cars in that train, during the time this Springfield brake car was run in the train?

A. There were single brakes.

1295 Q. 13. From what road did these cars with the single brake on them come?

A. From the Western road—as it was called then.

Q. 14. Which brake held the car best—the Springfield brake or the single brake?

A. The single brake, I think, was the most reliable.

Q. 15. Please state whether, during the time that this Springfield brake was used on this train, you 'ver complained to the brakemen, and, among others, to M'r Parker above named, about the train not being stopped properly by the brakes?

A. I did complain a great deal about it, and they would say they were not to blame. I did complain to M'r Parker.

Q. 16. State whether or not this train, which had this Springfield brake on it, when it was attempted to be stopped at stations, would frequently run by the stations before stopping?

A. It would.

Q. 17. What, if anything, did you do as engineer to aid in stopping said train at stations?

A. I reversed my engine and backed up to the station.

Q. 18. State whether you used to reverse your engine, under headway, to aid in stopping this train at stations?

A. I used to, frequently.

Q. 19. About how many cars, on the average, were run in this train from Worcester to Boston and return—including the cars which came from the Western road?

A. There were, on an average, 9 cars in this train to Boston—sometimes ten.

Q. 20. Please state about how many of these cars, on an average, came from the Western road, and how many from the Boston and Worcester road?

1296 A. Five from the Boston and Worcester road, and four from the Western—that was the regular train. The cars from the Western road were longer than the Boston and Worcester cars.

Q. 21. What kind of brakes were on these cars from the Western road, except the car that had the Springfield brake on it?

A. They had on single brakes.

Q. 22. And what kind of brakes on the cars that belonged to the Boston and Worcester road?

A. They were the Hodge brake.

Q. 23. How many brakemen were employed on this train?

A. There were three on the Boston and Worcester cars and three on the Western cars—making in all six—including the baggagemen of the two trains—which were made into one train at Worcester—there were two baggagemen on this train, and they sometimes braked.

Q. 24. Did you at any time run as engineer over the Boston and Worcester road on either of the express passenger trains between New York and Boston?

A. I did often—frequently exchanged with other engineers.

Q. 25. Did you use to run those express trains at the time when they had the Springfield brake on them?

A. I did.

Q. 26. How did the Springfield brake work on those express cars as to holding the trains?

A. They did not hold good; it would take more than as much again time to stop the trains at stations, as with the other brakes.

Q. 27. While running those express trains with the Springfield brake on them—did you frequently have to reverse your engine under headway to aid in stopping the trains at stations?

A. I did—oftentimes.

1297 Q. 28. You have said that it would take more than as much again time to stop those express trains at stations as with the other brakes; what other brakes do you refer to?

A. I refer to the Hodge brake.

Q. 29. Did you run on those express trains before the Springfield brake was put on them—and also after it was taken off of them?

A. I did.

Q. 30. At those times—before and after the Springfield brake was used on them, what kind of brake was on the cars when you ran them?

A. The Hodge brake.

Q. 31. State whether when the Hodge brake was used on them, you had any difficulty in stopping at stations?

A. None, unless the rails were bad, snow or ice on them, or something of that kind.

Cross-examination:

Cr. q. 32. When the Springfield brake was in use on those express line cars, was it applied to all the cars composing that line?

A. I should think not. It is my impression that there was one car in each train that had the Hodge brake on. I should say so, but am not positive.

Cr.-q. 33. Was this car with the Hodge brake on from the Boston and Worcester road, from the Western road, or was it an express line car?

A. I think it was a Boston and Worcester car.

Cr.-q. 34. With the exception of this one car with the Hodge brake on, did the other cars of the train have the Springfield brake?

A. I think they did.

Cr.-q. 35. Why was the car with the Hodge brake on attached to the train at Boston, and run through to Worcester and back, if it was so attached and run?

A. I don't know as I can give any reason. It was often run so.

1298 Cr.-q. 36. Was it for the reason that an increased number of passengers took the train at Boston for Worcester, and at Worcester for Boston?

A. There was a car run in that way for that purpose. There was a car run through to Springfield on those trains. I don't know the reasons why they run it. Sometimes they had passengers to fill it, and sometimes they did not. I mean the car run in the express train over the Boston and Worcester road.

JONATHAN G. WITHERBEE.

Subscribed and sworn to this 18th day of September, A. D. 1872, before me.

W'M B. HARDING.
Justice of the Peace.

Royal Boyden called and sworn.

Q. 1. State your name, age, residence, and occupation?

A. Royal Boyden; am 47 years of age; reside in Worcester, Mass.; am the master mechanic for the Boston and Albany road, formerly the Western road, at Worcester.

Q. 2. How long have you been employed on that road?

A. Have been on the road 17 years steady work. Have been master mechanic about 11 years in all; the first 10 years of this time commenced about 15 years ago, and then, after I had been master mechanic about 10 years, the company sent another man here, and he was master mechanic for about 4 years, during which time I was his assistant; he left last January, and since that I have been master mechanic again.

Q. 3. Do you remember about 15 years ago knowing of a litigation between M'r Hodge, the patentee of the Hodge car brake, and the 1299 Western Railroad Company; and do you know of orders being given at that time in reference to unhitching Hodge brakes when they came to the Western road; and if so, please state what those orders were?

A. I heard about a trouble between Hodge and the Western road in a roundabout way; did not have it directly from the officers. I knew there was some trouble about the brake business. I do know of orders being given about unhitching the Hodge brakes. I had orders to unhitch the brake-chains from the Hodge brake, and we did unhitch them.

Q. 4. Was this unhitching continued for a while and then given up ?

A. Yes.

Q. 5. During the time that the unhitching was continued, do you know whether brakes were ever hitched up again by the brakemen before the trains went out from Worcester over the Western road ?

A. I know of one instance.

Cross-examined:

Cr.-q. 6. To what company did the cars belong, the brakes of which orders were given to unhitch, and to what place were said cars destined after the unhitching had taken place ?

A. I don't remember to what company the cars belonged, and I can't say to what place the cars were destined.

Cr.-q. 7. What cars, at the time the orders were given, had the Hodge brake on them; were they Western cars, or Boston and Worcester cars ?

A. That I couldn't say. I know they were foreign cars—we called all cars outside of the Western road foreign cars—and when they came there we unhitched them.

Cr.-q. 8. Were the cars which made up the New York and Boston express line known to you as foreign cars ?

1300 A. We called them line cars.

Cr.-q. 9. Did you understand the order to apply to these line cars ?

A. I can't say as to that. I know we did not unhitch the brakes of those cars.

Cr.-q. 10. If a car belonging to the Boston and Worcester Railroad Company chanced to be in a train with a Hodge brake on it, and liable to be run over the Western road, did you disable said brake by unhooking its connections ?

A. I don't recollect of ever doing it to a Boston and Worcester car.

Cr.-q. 11. Counting out the cars of the Boston and New York express line, and those belonging to the Boston and Worcester Company, what other cars with the Hodge brake on would be likely to run over the Western road ?

A. I couldn't tell as to that.

Cr.-q. 12. Were there passenger-cars with the Hodge brake on belonging to any other line or company than those above named, which came to Worcester in any train on its way over the Western road ? If so, name the company or companies to which said cars belonged.

A. I couldn't tell now to what road they belonged to.

Cr.-q. 13. Were the cars on which you detached the brakes sent on their way without any brakes on which the brakemen could rely in stopping trains in case of an emergency ?

A. That I don't know. After I unhitched them, it was the extent of my duty.

C.-q. 14. After the brakes were unhitched were they by this act incapacitated for stopping the car in case of a necessity to do so ?

A. I can't answer that.

Cr.-q. 15. In unhitching the Hodge brake on foreign cars, what
1301 did you do in order to fulfill the order which you say you received
from the officers of the Western road ?

A. I just barely unhitched the hook from the brake-lever.

Cr.-q. 16. From the brake-levers of each truck ?

A. Yes.

Cr.-q. 17. Will you now please state, as master-mechanic, whether the Hodge brake, unhooked as you have stated, would be of any service whatever in stopping the car in case of an emergency?

A. It would not after it was unhooked.

Redirect:

Q. 18. Have you a distinct remembrance of unhitching the Hodge brakes from foreign cars which came to Worcester bound over the Western road, although you can't now recollect the names of the companies to which such cars belonged?

A. I have unhitched the chains, but I can't tell to what road the cars belonged. I have a distinct remembrance of doing that.

Recross:

Cr.-q. 19. Did you yourself unhitch the chains of more than one car?

A. Yes.

Cr.-q. 20. How many more?

A. I could not tell how many more; quite a number of them.

Cr.-q. 21. How long did you continue this unhooking?

A. It was a month certain that we unhitched the chains.

Cr.-q. 22. At what time was the order countermanded?

A. I don't remember of having any order in regard to that.

1302 Cr.-q. 23. Did you presume to violate the order by ceasing to unhitch the Hodge brake on foreign cars?

A. I have nothing to say.

Redirect:

Q. 24. You say you don't remember any order countermanding, but you have said that after a while the unhitching was discontinued; what led you to discontinue it?

A. I can't answer that.

Q. 25. Do you remember, at any time after receiving the order to unhitch, hearing that the Western Railroad Company had obtained the right to use the Hodge brake?

A. I don't recollect; I have nothing to say about that.

ROYAL BOYDEN.

Subscribed and sworn to this 18th day of September, A. D. 1872, before me.

W'M B. HARDING,
Justice of the Peace.

Deposition of George H. Gardner, taken at Boston, Sept. 21, 1872.

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

A. Geo. H. Gardner; age, 29; residence at present at Charlestown, Mass.; occupation, brakeman on the Boston and Maine Railroad.

Int. 2. How long have you been brakeman on the Boston and Maine Railroad?

A. Since the 2d day of August, 1872.

1303 Int. 3. How many years in all have you been brakeman on different railroads?

A. Since sometime in June, 1866; I can't state the date—about the middle of June, 1866.

Int. 4. During this period, what kind of trains have you broke upon?

A. I have, I think, broke upon almost all kinds of trains, except gravel-trains, that have been run—freight, passenger, accommodation, and express.

Int. 5. Where were you braking before, or shortly before, you went on to the Boston and Maine Railroad?

A. On the Boston and Albany, sir.

Int. 6. About how long a time did you brake on the Boston and Albany Railroad?

A. The last time that I was there—I have been on the road three different times; I have been away on vacations at times—I commenced April 19, 1872, and remained until the 30th day of June, 1872.

Int. 7. During this time did you brake on a train known as Conductor Jennings' train?

A. Yes, sir.

Int. 8. Did that train have in it cars with brakes on them known as the Springfield brake?

A. Yes, sir.

Int. 9. Between what points did you run as brakeman on that train?

A. Between Boston and Springfield, and return.

Int. 10. Going out of Boston, how many cars were run on that train?

A. Five, as the general number.

Int. 11. Returning from Springfield to Boston, how many cars were run in that train?

A. Six; sometimes seven; and as many as eight or nine at different times.

Int. 12. Do you recollect how many cars there were run in that train which had these Springfield brakes on them?

1304 A. Baggage-car, mail-car, smoking-car, and two first-class passenger-cars—five cars in all, I think.

Int. 13. When the train had in it six or more cars—when it was returning from Springfield to Boston—what kind of brakes were on these other cars, not the Springfield-brake cars?

A. What they called the Hodge brake, I think.

Int. 14. The sixth car generally came behind, and took the slack of the train?

A. Yes, sir. My station was on the rear car always.

Int. 15. About how much of the time, when that train was returning from Springfield to Boston, would it average six cars?

A. During the week of the Jubilee we had various numbers, but as a general thing there were six cars.

Int. 16. And this sixth car, you say, had the Hodge brake on it?

A. Yes, sir.

Int. 17. While on that train, did you yourself brake on any of these Springfield-brake cars?

A. Yes, sir.

Int. 18. When you broke on any of said Springfield-brake cars, at what part of the train were you stationed?

A. At the rear of the train.

Int. 19. When you broke on said Springfield-brake cars, how did said brakes work?

A. Well, sir, they worked very poorly.

Int. 20. What difficulties did you find with them in holding the train?

A. Well, they couldn't hold the slack of the train. Going from Boston to Springfield, we had five cars, and generally I had to put one brake to use myself—going to Springfield. I had but one to use to take the slack of the train. I had the Springfield brake every other day.

Int. 21. And how do you say that this Springfield-brake car would take the slack of the train?

1305 A. Not very well. I often told the brakemen on the forward end of the train not to touch the brakes until I took the slack of the train, and then brake up as quick as they could, so as to run up to the station and make a quick stop. I found that wouldn't work, because I would set my brake as hard as I could, and they would wait for me to take the slack of the train, and we would very often run by. I would ask them why they didn't brake, and they would say they were waiting for me to take the slack.

Int. 22. Why did you request them to wait until you had taken the slack of the train, and then brake quick?

A. I always made that a rule, while braking on the rear of all trains.

Int. 23. When braking on this rear car with the Springfield brake on it, were you or not able, when the brake was applied, to keep the car from running upon the car next ahead of it?

A. No, sir; they often ran together. I spoke to the conductor a number of times about it—that they must have the brake fixed, and they said they would. I told them that I would like to have them shifted out, and have a car put behind that I could take the slack with.

Int. 24. Was it ever, while you were on the train, fixed so that this difficulty was obviated?

A. It was reported a number of times, and they said they had fixed it; but I failed to discover any improvement in it.

Int. 25. Did you notice how these Springfield brakes, when they were applied, worked when the car passed from a straight track to a curve, or on to a reverse curve? And, if so, state how they worked.

A. I think it worked rather poorly on a curve; not so well as on a straight line. I noticed a number of times, when I set the brake on a straight line, and run on to a curve, I would find, after setting it
1306 as hard as I could on a straight line, on running round on a reverse
curve, that I could set it a little more then; it would slacken it; and going on a curve the other way—reverse curve—I would find I had done all I could; I couldn't set it any harder.

Int. 26. Did you complain to the proper persons connected with the railroad about the operation of these Springfield brakes?

A. Yes, sir.

Int. 27. Did you do so more than once?

Ans. I think I had run on the train about three days when I reported them the first time.

Int. 28. What did you say about them when you so reported them the first time?

A. I reported at Springfield, to the man who looks the trains over there, and told him they would have to take the connections up or put some new shoes on; that I couldn't hold the train or the car. He told me that it could not be done there; that it would have to be done in Boston.

Int. 29. Was it finally done in Boston?

A. The next trip the car came back to Boston. I reported it in Boston, and told them they must put some new shoes on.

Int. 30. Were new shoes put on at this time, or soon after?

A. They were put on car 123 the same night. They refused to do it at first, but I told them I was told in Springfield to have it done in Boston, and they went to work and put them on to car 123, and it was so late that they said they couldn't put them on 124—so they sent the train off. But when they came back the next round trip, they were put on car 124.

Int. 31. State whether this putting on new shoes improved the working of the brake any.

A. I think it held a little better. I thought, by the way it worked, the connections had not been let out. They had been taken up some with the old shoes on.

1307 Int. 32. You say it worked a little better. State whether it worked well enough to enable you to take the slack of the train.

A. I would set the brake, and I would hold my car back—take the slack of my car; I would set the brake as hard as I could set it, and when the brakeman ahead would apply the rest of the brakes (they had two apiece and I only had one), then I couldn't keep my car from them. I mentioned it to the conductor, I think, once or twice; told him I would like to have a different car behind, or a different brake; because if the train should break apart I should be sure to run into them.

Int. 33. Did you at any other times complain of the manner in which the brake worked?

A. Yes, sir.

Int. 34. State whether, at any time after any of these complaints, it was fixed so as to remedy these defects.

A. I saw no great improvement in it after reporting it. I reported it to the man who does the switching. I asked him if he wouldn't shift 123 out, and let me have 124 behind, and see if that would do any better; but he didn't do it.

Int. 35. State whether, while you broke with these Springfield brakes, the train would ever run by the stations.

A. Yes, sir; very often.

Int. 36. Did they run the Hodge brakes in this train every other day?

A. Yes, sir.

Int. 37. When the train had all Hodge brakes on it, was there any difficulty in stopping at stations?

A. No, sir; I found that it required a good deal of judgment on that train. I never was on a train where it required so much judgment as it did on that train; there was so much difference between the Springfield brake and the Hodge brake. When we had the Springfield brakes on I worked very hard, and we very often ran by. I would go to Springfield and would have the train back with the Hodge brakes on, and very often I took hold of the Hodge brakes the same as I had been working on the other train; I would brake up quick and very hard, and very often I would stop short of the station. 1308

Int. 38. With which brakes, the Springfield or the Hodge brakes, did you commence to brake the farthest back when approaching stations?

A. The Springfield brake. I generally took the slack of the train the length of the train sooner with that than with the Hodge.

Cross-examination by M'r Whipple:

Cr. 1. Was the Springfield brake ever in working order while you operated it?

A. I never considered that it was, properly.

Cr. 2. What trouble did you find in operating the brake, as applied to car 123?

A. When I first reported it, I found that the shoes were all worn off.

I would set the brake up—wind it clean up to the rod, or near it, so that I couldn't do any more.

Cr. 3. That is to say, you had no control over the wheels—the chain was so short?

A. I thought that was the trouble with it.

Cr. 4. Did you find the same difficulty with No. 124—the shortness of the chain?

A. The chain was longer on 124, but I didn't have any occasion to use that much.

Cr. 5. Could you, at any time, hold or take the slack of the train with car 124, with the Springfield brake?

A. I never had that car behind to take the slack of the train with, to my knowledge.

Cr. 6. You always had No. 123 with your train?

A. When we didn't have the other cars, I had that—one way.

1309 Cr. 7. This short chain would come up solid against the hook of the brake-shaft on which the chain winds?

A. It would fetch up under the platform solid, so that I couldn't do any more. It would come to a bearing underneath.

Cr. 8. Which do you mean, the brake or the hook, came up solid against the shaft?

A. The hook, under different circumstances. Setting the brake is different. There is as much difference in setting it as the different positions you would get a car in.

Cr. 9. Had the connections been taken up or made longer, and new shoes put on, would the Springfield brake have worked well, in your judgment?

A. I think it would have worked quite well on a straight line, but on a curve I think it would not work well.

Cr. 10. What curves are there on the Boston and Albany Railroad, and where are they located, on which you observed a difference in holding, whether on a straight track or a curve?

A. Backing the train from the house here in Boston, in this passenger station.

Cr. 11. How sharp was that curve on which you made this observation?

A. Well, sir, there was considerable of a curve there. We backed out on something like an S; not so very much of a curve—something of the shape of an S, and run out on to a reverse curve. In backing out from the station, passengers would run across the street ahead of me, and I would set my brake and hold a bit, just to keep the cars steady, as they would throw them out, and when I would come around that curve they would almost stop. I would throw off my brake, and I would find it was set very hard. When I would come around the other
way, on the other curve, the brake would be set a little, and
1310 and I would find it all slack and not holding any, and then I
would have to set it up considerable.

Cr. 12. In your judgment, would the operation of the brake be affected on any curve that is in the main track out of the city of Boston, and between it and the city of Springfield?

A. I think, sir, if the curve in Boston here would affect the brake a great deal, it must be affected to some extent on any curve, in any situation.

Cr. 13. Do you think the operation of the brake would be sensibly affected on the curves as they appear ordinarily on that road?

A. I do, sir.

Cr. 14. To what extent do you think the operation of the brake would be affected on a curve of 800 feet radius.

A. I think to apply the brake on a straight line—going from here to Springfield on a straight line—and turn round to the right on a curve, it would slacken.

Cr. 15. On such a curve as the question names? and I name the sharpest curve in the main line of that road.

A. Yes, sir.

Cr. 16. If you could be relieved as brakeman for a while from the Boston and Maine Railroad, would you go on the Boston and Albany Railroad and operate the brakes on cars 123 and 124, and state with what result?

A. Yes, sir.

Redirect by M'r Cozzens:

Int. 39. You have said that under some circumstances the hook of the connecting rod would be drawn clear up against the windlass shaft. Did this take place when you were applying the brake on straight lines, or when you were applying it on curves?

A. On curves.

1311 Int. 40. With which brakes, the Hodge or the Springfield, did you have to work the hardest?

A. With the Springfield brake.

Int. 41. Are you a strong, powerful man?

A. I consider myself so.

Int. 42. What effect did this working harder produce on your hands?

A. Well, I had some of the sorest hands I ever had in my life, and my hands didn't look quite so bad as the rest of the brakemen's on the train.

Int. 43. In this respect how does the Hodge brake affect your hands when you use that in your ordinary business of braking?

A. They are an easier working brake. I think they are generally cast iron, and very smooth—painted, I should judge. With the Hodge brakes you can set them up very hard, and still you can swing on them and gain a few inches more. With the Springfield brake I would set that up hard and it would seem to come to a standstill; I would brace myself back and swing on it very hard, and I found I couldn't gain anything. It would give me a considerable racking.

Int. 44. As you ordinarily use the Hodge brake in your experience as brakeman, do you find that it callouses your hands much of any?

A. Not very bad. In my six years' railroad experience I was never on a train that I worked so hard on as I did on that Springfield-brake train.

Int. 45. In how much less distance, if any less, could you stop a train with the Hodge brake than you could with the Springfield brake?

A. I think I could stop a great deal quicker and with more ease; I never have tried to see. [I have always noticed that the men on the train would very often tell me that they had a pretty easy run of it; they would say that when we got in, and I would ask them if they didn't have to brake just as hard as they ever did, and they would
1312 say, no, they didn't hardly touch the brakes.] We very often took on car 67, I think at Worcester, that had the Hodge brake on it, which is as good a brake, I think, as I ever got hold of, although it is an old car; I could almost hold the train alone with it, and very often I had to let it off to let the train up to a station; and then I would ask the men what they broke so hard for—why they didn't let the train

run up before they stopped it; and they said they were not braking; and I came to the conclusion then I was holding the train alone.

Int. 46. Could you judge in about what relative time you could stop a train with the Hodge brakes as compared with the Springfield brakes; whether twice as quick, three times as quick, or as the case may be?

A. I think I can stop a train the length of it quicker with the Hodge brake than with the Springfield.

Recross by M'r Whipple:

Cr. 17. Is the wheel of the Springfield brake on car 123 painted?

A. I think not. It is made of rough casting. I once reported that to M'r Ray, and asked him if he wouldn't take that old brake-head off and put another one on; it tore my hands so, it was so rough; but he didn't do it. I think the other brakemen on the train reported it when they had it.

Cr. 18. Did you ever have occasion to complain that the Hodge brake did not work well?

A. Not very often, sir. Once, I think, I broke the brake-chain on one of them; reported it, and it was fixed.

Cr. 19. Are all brakes liable to get out of order?

A. Yes, sir.

Cr. 20. When out of order can you depend upon them to hold a train?

1313 A. When a brake is out of order I always make it a rule to report it and have it fixed as soon as possible, or set the car off.

Cr. 21. On what train are you now acting as brakeman, on the Boston and Maine Railroad?

A. I have no regular train, sir; I am freight-shifter in the yard, and doing out-of-town work.

Cr. 22. Are you usually at the depot of the Boston and Maine Railroad in this city?

A. I am at the freight depot in the morning.

GEORGE H. GARDNER.

Deposition of Robert W. Bibber, taken at Boston, Sept. 21, 1872.

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

A. Robert W. Bibber; age, 45; residence, South Boston; occupation at present, sailing-master of a yacht.

Int. 2. Were you ever employed as locomotive engineer on the Boston and Worcester Railroad?

A. I was.

Int. 3. About how many years did you run on that road as locomotive engineer?

A. Twenty years, sir.

Int. 4. About how many years of this time, if any, did you run as locomotive engineer on the New York and Boston express lines over that road?

A. About 17 years.

Int. 5. Part of this time did you run on the day portion of those lines and part of the time on the night portion?

A. For four years I run the day line.

Int. 6. The rest of the 17 years the night line.

A. Yes, sir.

1314 Int. 7. Do you remember that, a number of years ago, there was a brake called the Springfield brake put upon the cars of those express lines?

A. Yes, sir; on what we termed the through cars, running from Boston to New York.

Int. 8. Did you run the trains during this time that these Springfield brakes were on them?

A. I did, sir.

Int. 9. Please state as to how these Springfield brakes worked as to holding the trains.

A. Well, sir, I did not consider them reliable at all times.

Int. 10. During the time that these Springfield brakes were on these trains who was the brakeman or baggage-master on whom you chiefly relied on the train which you ran?

A. Well, the baggage-master or brakeman was baggage-master up and brakeman down. He was local baggage-master to Worcester and rear brakeman from Worcester to Boston—the man that I relied upon coming to Boston.

Int. 11. And what was his name?

A. John Moran.

Int. 12. At any time while these Springfield brakes were used on that train do you recollect any circumstance connected with the repair of a bridge at Grafton in reference to how those brakes would hold a train? If so, please state it.

A. I do, well. The abutments of the bridge at the foot of Millbury hill, near Grafton, within three-quarters of a mile of the depot, were rebuilt, and during the rebuilding the tracks were thrown together. We had to reduce the the speed to about three miles an hour over that portion, and I have often noticed there were times that he would hold me at that, and at others he said he couldn't.

Int. 13. This was while the Springfield brakes were used, was it?

A. Yes, sir.

1315 Int. 14. You say "he." Whom do you mean?

A. Moran—as he was the man that I relied upon.

Int. 15. While this Springfield brake was used, would or not the trains frequently run by the stations?

A. There were times, sir, that they would be stopped short, but more times run by.

Int. 16. Did you or not, while these Springfield brakes were used, have to reverse your engine to aid in stopping the trains?

A. Yes, sir; quite often. In coming over this portion of the road where they were rebuilding this bridge, I often had to come over it with the engine reversed.

Int. 17. What was the name of the brake that was used on those cars before and also after these Springfield brakes had been used?

A. Really, I can't tell you.

Int. 18. Was it the Hodge brake?

A. I think it was, sir, but I won't be positive. But we used to term it "the double brake."

Int. 19. Did you, while the Springfield brake was used on these cars, observe whether the brakemen had to apply the brakes at an earlier point when approaching stations than they did when the Hodge brake was used?

A. I did, sir.

Int. 20. When you were using the Hodge brake on those trains, did you have to reverse your engine to aid in stopping the trains?

A. No, sir.

Cross-examination by M'r Whipple:

Cr. 1. What year was it that the Springfield brake was used on the New York and Boston express line?

A. I think it was in the spring of 1857. It has been some few years since I left the road, sir, and it has somewhat slipped my memory.

1316 Cr. 2. How long were the Springfield brakes in use on the New York and Boston express line cars?

A. I can't tell you how long, but I should judge about a year.

Cr. 3. Were they applied to all the cars on that line?

A. I think they were, sir; I won't be sure.

Cr. 4. You say that the Hodge is what you called "the double brake"?

A. It used to be a term we used, sir.

Cr. 5. Was the Springfield brake termed a double brake, also?

A. I think not, sir.

Cr. 6. What was it called?

A. I never heard it called anything but the Springfield brake, sir.

Cr. 7. Did it operate on both trucks at the same time?

A. I believe, sir, that both trucks were connected with the same windlass shaft.

Cr. 8. In that case they would operate on both trucks, would they not?

A. To a certain extent, sir.

Cr. 9. Is any brake anything more than connecting the two trucks with each other, and operating them from one windlass shaft?

A. I think they are, sir.

Cr. 10. Wherein do they differ?

A. I think the difference is with the double lever, sir.

Cr. 11. How many levers are there in the Hodge brake, and how many in the Springfield brake?

A. I think there are two in the Springfield.

Cr. 12. And how many in the Hodge?

A. I think there are three, if I am not mistaken. It has been some time since I looked these matters over.

1317 Cr. 13. Then you would not call a brake that connected both trucks with the windlass, and operated them at the same time, a double brake?

A. Not in the manner that the Springfield brake did, sir.

Cr. 14. What was the average speed that you were required to run the New York express train at that time?

A. It was 32 miles per hour.

Cr. 15. How many stops were you required to make between Worcester and Boston, with the Springfield brake?

A. Well, at different times we had first to stop for this bridge, then at Westboro', Framingham, and Newton Corner; at other times we only had to stop at Framingham.

Cr 16. Going either way?

A. Either way, sir.

Cr. 17. If I understand you, you run this train of express cars only from Worcester to Boston and return?

A. That is all.

Cr. 18. And made, ordinarily, one stop—that is, at South Framingham?

A. Yes, sir.

Cr. 19. Was it a frequent occurrence with you to run by the station at South Framingham?

A. While we used the Springfield brake, sir.

Cr. 20. Did you ever run by there with the Hodge brake?

A. We might at times when the track was slippery—wet; but with a good rail, not.

Redirect by Mr. Cozzens:

Int. 21. Was it a frequent occurrence with the Hodge brake?

A. No, sir; it was not.

Recross by M'r Whipple:

1318 Cr. 21. Might it not have been a frequent occurrence, had the rail been wet, slippery, or frosty?

A. It might have been, yes, sir; with a frosty rail.

Redirect by M'r Cozzens:

Int. 22. When the rail was good, was it or not a frequent occurrence with the Springfield brake?

A. Yes, sir. It was often stopped short, also, with the Springfield brake.

Int. 23. Do you know why it was that they often stopped short with the Springfield brake?

A. Yes, sir.

Int. 24. Please state why.

A. They couldn't govern the brake; that is, they would put it on a mile back, at times, to be sure.

Recross by M'r Whipple:

Cr. 22. Was it, as a general rule, applied a mile from the station?

A. It was not, sir. The rule was the brakeman's judgment.

ROBERT W. BIBBER.

Deposition of William O'Brien, taken at Boston, September 23, 1872.

Direct examination by M'r Sayles, in person:

Int. 1. What is your name, age, residence, and occupation?

A. William O'Brien; age, 24; residence, Boston; occupation, brakeman on the Boston and Albany Railroad.

Int. 2. How long have you been brakeman on the Boston and Albany Railroad?

A. About four years, sir.

1319 Int. 3. On what trains?

A. Passenger trains. My first work on a train was on the owl train—out from Boston at half-past eight. I ran on that train about six months; then I was spare brakeman for a few weeks; then I ran on what we call the 9.45 train—going out from here in the morning, rode up to Worcester dead-head, and broke coming back, getting here at quarter before 12; then I went out on the train that left here at 7 o'clock in the morning and got back at quarter-past six.

Int. 4. What trains have you been braking on during the last six months?

A. Jennings' train was the first train I went on when I came back on the road. It left here at 5 o'clock in the morning, and got back at half past 3.

Int. 5. What kind of brakes were used on the cars of Jennings' train when you were braking there?

A. We had two kinds; one day we had the Springfield brake out of Boston, and the next day we had the Hodge. We would have the Springfield brake up from here in the morning, and the Hodge brake down in the afternoon. The next day we would have the Hodge brake out from here in the morning, and the Springfied brake back in the afternoon.

Int. 6. Between what places did you run?

A. Between Boston and Springfield.

Int. 7. Who was rear brakeman on Jennings' train when you were running on it?

A. When I first went on there was a fellow by the name of Braman—a stout fellow. He broke on the train with me perhaps a week after I went there, and then there was a man came on by the name of Gardner. He was an old brakeman, but he had been off, the same as I had, but came back again, and went on this train.

Int. 8. How did the Springfield brakes work in stopping the trains at stations?

A. Well, we would go out from here in the morning with the
1320 Springfield brakes on; we would come to the Providence crossing; that don't amount to much of a stop any way; and on that train he used to whistle for brakes at stations, and we would run up close; I have had him call for brakes at stations, and we would go away by on him. The way of it was, they used to find fault with the parties; one would find fault with the other, say he didn't brake; Gardner would say I didn't brake, and I would say he didn't brake, because he never took the slack of the train in going round curves, or anything like that, with that brake; for instance, if there was a station where there was a curve just before getting to it, nine times out of ten we would go by the station; we supposed we had the brakes set, but when we came to find out they wouldn't be set; there would always be a catch in them somewhere; in one instance—at Brimfield, a flag station on the Western Railroad about twenty miles from Springfield or a little more—where we were due to meet the train that leaves Springfield at quarter-past seven (we left at five), as we were going in there one morning—we were running slowly; the engine was shut off; she wasn't working any steam—this Springfield train had got in there and was just stopping. Of course, we had to stop, because it was against the rules to allow two accommodation trains to come into a station at the same time, and be called for brakes. I set my hind brake as hard as I could and stepped over and set my forward brake as hard as I could; used all my strength, and was leaning over to look out, and it seemed as if I could feel the brake was not set, and I swung round and set it at least a dozen notches, if not more. That scared me, because when they whistle for brakes every man is supposed to set his brakes as hard as he can, and finding they were not set, when I supposed they were set hard, I was scared; I thought the conductor would report me for not doing my duty, and for not setting the brakes hard, but he didn't—
1321 as he generally does when they whistle for brakes—come out
and set the brake. Then another day—coming down with that brake (I mention these things about it)— we were coming into Riverside and he whistled for brakes again, and as I set the brake I felt a sharp yank, and the brake-wheel went right away from me and threw me against the railing, and I wasn't quick enough to get my wrist from the brake-wheel, and the skin was torn off the whole side of my hand, and I couldn't hardly use it for a week. I used to use it some, because it didn't take the strength out of it, but it was sore whenever I touched anything. And quite frequently I used to feel that yank, and I would feel kind of sore after I had been there a week, and I couldn't think what it was that made me sore. The brake would give a sort of yank, and the wheel would pull right away from me, in spite of all my power.

Int. 9. At what time was this pulling of the brake away from you?

A. It used to be when we came to those stops at Cordaville and Riverside and Brimfield. I don't know as I used to notice it so much at Brimfield, but at Cordaville and Riverside it threw me very hard against the railing, and not being quick enough to get my hand off the wheel, it gave me a sharp yank.

Int. 10. Was this on going round from a straight track on to a curve?

A. Yes, sir; it was just as we came on to the curve at Riverside; and Cordaville is on a curve, too, and Brimfield is on a curve.

Int. 11. If I understand you, while you were applying the brake in going from a straight track on to a curve, when it struck a curve it would jerk the brake-wheel out of your hands?

A. Yes, sir; I used to feel it at Spencer, too. It is down grade there, and the train goes very rapidly, because it is upon a hill—down 1322 a sharp grade—what we call the Spencer grade—and going in there in the morning before now the train would run by. The brake would give that yank, and of course it would jerk the wheel out of my hands, and I would have to brake up again. We would be going in there at what seemed a dead stop, and all at once there would seem to be a sort of rattle, or something, and that would make the train slide right by on a jump. I used to speak to Ned Jennings, the car-inspector at Springfield, and tell him to take up the chain. The lower chain would go down underneath and catch in the nut, and it would bother me, because there would be no chance to get a purchase on the other chain to amount to anything.

Int. 12. Did you have any difficulty in stopping trains at stations when you had the Hodge brake on the train?

A. Oh, no; Lord bless you, no. We never had any trouble with that. We could always make good stops with the Hodge brake. Coming down here, we run together, and George Gardner used to say we would make good stops coming down. Says he, "We have got a good brake to day, and I have got the hind end of the train, and you wait until I take the slack." I says, "I will." We have actually gone by Indian Orchard and there would be no remark made. Luke Hodgkins would be the engineer, and be late, and we would go by Indian Orchard twice the length of the train.

Int. 13. How long were you on Jennings' train?

A. I was on there a month; I knew that by drawing pay. I should say I was there five weeks, if not more. I went on two or three days before the month came in, and stayed there until after pay-day. The fourth working day we got pay.

Int. 14. How many cars were run on this Jennings' train in coming from Springfield to Boston?

A. We generally used to have six down.

1323 Int. 15. How many cars had the Springfield brake on?

A. I believe five.

Int. 16. What brake did the sixth car have on it?

A. The Hodge, I think.

Int. 17. How many cars did you have in the train going to Springfield?

A. Five out of Boston.

Int. 18. Did all five of these cars have the Springfield brake?

A. Yes, sir; one morning up.

Int. 19. How did the Springfield brake work on a straight track?

A. Sometimes it would hold very well on a straight track; and then again, going into Brookfield—there is a curve going into there, just before you get to the station, and then it is a straight track—I have seen it work first rate, hold the train, and I have seen us go by there with it. But generally we were running very slow there. There wasn't much braking there at all.

Int. 20. You say sometimes it would work very well on a straight track?

A. Yes, sir.

Int. 21. I should judge, then, your idea was that it would work better sometimes than it would at other times on a straight track?

A. Yes, sir.

Cross-examination by M'r Whipple:

Cr. 1. Are you still employed as brakeman on the Boston and Albany Railroad?

A. Yes, sir.

Cr. 2. On what train are you running now?

A. I leave here at 11 o'clock in the forenoon and get back at half-past 6. The "Worcester accommodation," they call it. It is a new train put on the 10th of June.

(The deposition was read to the witness.)

1324 Cr. 3. Have you heard your testimony all read over to you since you gave it?

A. Yes, sir.

Redirect by M'r Sayles:

Int. 22. You spoke of its making you sore. Where did it make you sore?

A. Right across my chest; in the cords, right here.

Int. 23. What made that?

A. All the way I could account for it was the yank I used to get from the Springfield brake, because I didn't feel it until I went on that train, and when I got off of it for three or four days I was quite sore, but afterwards I got over it. I haven't felt it since.

Recross by M'r Whipple:

Cr. 4. Do you authorize the commissioner to sign your name to this?

A. Yes, sir.

W'M O'BRIEN.

Deposition of Hervey Waters, taken at Boston, Sept. 23, 24, and 25, 1872.

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and profession?

A. Hervey Waters. Age, 68. Residence, Boston. Machinist.

Int. 2. Please state what have been your opportunities for acquiring a knowledge of mechanics and machinery?

1325 A. I am a machinist by trade and have been employed in machinery since I was 16 years old, and for something more than 20 years of my life last past I have been accustomed to the examination of patents and the drawings connected therewith, and to giving evidence thereupon in the [illegible] tes courts.

Int. 3. Were you engaged as expert in the litigation between Ross Winans and the railroad companies several years ago, in reference to the eight-wheel railroad-car; if so, for about how long a time were you engaged in that litigation?

A. I was engaged in that controversy on several occasions, on the part of the railroads, running through some 15 years or more, I believe.

Int. 4. Will you state what opportunities you have had of acquiring a knowledge of railroad-car brakes and of their operation, and state whether you have ever been called upon to testify as an expert in any suit upon letters patent for improvements in car brakes?

A. My attention was first called to the operation of car-brakes and to patents for improvements thereon, some 18 years ago, I believe, in the trial of a case at Albany against the Erie Railroad for infringing the patent of Batchelder and Thompson assigned to Tanner. Since that I believe I have, on one occasion, helped try a case at Canandaigua against the Central Railroad, on the part of Hodge, the plaintiff; and since that a case at Windsor, on the part of the railroads in a suit brought upon the Turner patent against the railroads.

Int. 5. Will you state whether you are familiar with the construction and operation of the car brakes known as the old single brake and the Springfield brake?

A. I am. I have had occasion to look into their mode of operation considerably.

1326 Int. 6. Was there testimony given by you or by anybody else in your hearing, respecting said single brake and Springfield brake, in the suit mentioned by you as having been tried at Albany on the Tanner brake patent?

A. I do not now remember as to any testimony at Albany upon the old brake, but I do remember that the Springfield brake was pretty fully discussed there, and that evidence was introduced upon it there on the part of the railroads. I heard the car described there by a gentleman from Springfield, whose name I do not now remember. I recollect the description of the car pretty well.

Int. 7. Have you examined a certified copy of the letters patent of the United States issued July 6th, 1852, to Henry Tanner, as the assignee of Batchelder and Thompson, for an improvement in car brakes; and, if so, do you understand the construction and operation of the mechanism therein described?

A. I have, and I understand the contrivance therein described.

Int. 8. Are you familiar with the construction and operation of the two forms of double-acting car-brake known respectively as the Hodge brake and the Stevens brake?

A. I am.

Int. 9. Will you please state any conditions which occur to you as being involved in the problem of successful braking of the class of cars known as eight-wheel cars—as they are now run and during the time you have been familiar with car-brakes, have been run—upon railroads in the United States? Please answer fully.

A. The method of bringing up a train of cars upon a railroad when they are running thereupon, requires the employment of the same means that are employed for getting that train in motion; and by "the same means" I refer to the bite of the wheels upon the rails. In getting the train in motion, it is accomplished by means of the driving wheels of the locomotive biting upon the rails of the road. 1327

In bringing up the train when the locomotive is not reversed, the train is brought up by the bite of the other wheels of the train upon the rails; and as this is the only available force which can be used, a proper braking involves the use of all the other wheels except the wheels of the locomotive. It is not desirable to use the driving-wheels of the locomotive to bring up the train, because this cannot be done

without reversing the motion of the engine which is objectionable. Now, it is important that this bite of the wheels upon the rails should be used as nearly to its fullest extent as possible, and therefore the brake should be applied as nearly to the point of friction which will overcome the bite upon the rails as possible and what will bring up the train in the least possible time. If this is exceeded and the wheels are made to slide upon the road by applying the brakes too tightly; the train will not be brought up as soon as it will if the wheels do not have the brakes applied quite so tightly. Now, this last proposition is not always accepted as true by parties who think they understand this problem, but it is true, nevertheless; and any person who has ever observed the working of a locomotive in its attempts to start a heavy train of cars, will have observed that sometimes the wheels of the locomotive are made to slide upon the rails before the train is in motion. Now, whenever this takes place it is necessary to reduce the pressure of the steam upon the pistons of the locomotive, so that the wheels may come to a stand-still upon the rails before the train can be put in motion. The bringing up of a train of cars by means of the brakes is the converse of this. If the brakes are applied so tightly as to cause the wheels to slide upon the rails they will have to be loosened until the wheels bite upon the rails before the full braking effect of the brakes upon that train can be utilized. So that, in consequence of this fact it
1328 becomes necessary that the windlasses of a car should be so proportioned that the brakeman must use nearly his whole available strength in order to brake up the train, or else he will be in danger of putting his brakes on too tight and thereby to a large extent defeat the very purpose which he has in view in applying the brakes.

Another proposition is that in order to brake up a train of cars effectually, all the brakes should be applied as nearly simultaneously as possible, producing thereby the least jar upon the train, and bringing the same up within a shorter distance than can be accomplished in any other way. Now, the railroads of this country are generally considerably crooked—more so than they are in other countries, where the lines of road are not so long as they are here, and where more money per mile is put into them; and for that reason it has been necessary to use the eight-wheel cars—and by that I mean, not simply cars with eight wheels, but eight wheels in two trucks, four wheels in each truck—because it has been desirable to have the cars of considerable length, and in order to run the long cars upon crooked roads it has become necessary to introduce these trucks. Now, the trucks themselves are what the old cars were—they have two axles and four wheels, the same as the old car had, and these two axles are considerably near together in the truck—usually about as near together as the rails are in the track; and by the use of these trucks it has become practicable to have the car bodies very long and still run curves without any difficulty. But the very fact of the introduction of these trucks to the cars has produced a difficulty in the application of the brakes. It will be easily understood that if the brake was applied upon the truck itself—the same as it was upon the old car—the state of things would be very different from what it is when used upon the long car, where the windlass is of necessity upon the
1329 body of the car, but the levers and the brakes are upon the trucks of the car so that there has to be a connection between the body of the car and the trucks of the car, for the purpose of working the brakes upon the trucks of the windlass upon the body of the car.

There is also another condition which comes in here, in consequence of the use of these long cars, and the way they are used in this country.

The passage-way between the seats is fore and aft of the car, and not only fore and aft of the car, but fore and aft of the train, so that an alley-way is left from one end of the train to the other; and therefore the windlass, which is for the purpose of bringing up the brakes, must be placed upon one side of this alley-way, and outside of the central line of the cars. Now, this fact of placing the windlass in this position makes it necessary to have a peculiar manner of connection between the windlass and the truck levers. That connection must be such, in order that the brakes should work well, as to enable the trucks to turn upon their king-bolts so as to accommodate themselves to curves without varying essentially the tension of the parts which act to bring up the brakes from the windlass upon the body of the car. This matter of the two trucks under the long body of a car was the subject-matter of the Winans patent, which was in controversy some twenty years in the courts of this country; but those trucks have gone into general use, and the use of them has always involved this difficulty, to which I have referred, of connecting the windlass with the trucks. It was involved in the old cars before the double brakes were attempted, when the brakes were single, because the windlass being upon one side of the line of the king-bolts, and it being necessary to make an attachment from the windlass so as to act longitudinally with the car, it was necessary to make the connections to the trucks upon one side of the king-
1330 bolts; and, therefore, whenever those trucks ran from a straight line onto a curve, or from a curve onto a straight line, there was always difficulty with the old brakes. Now, the Springfield brake was so constructed that a connection was made, not only from the windlass to the truck-levers of one truck, but also to the truck-levers of the other truck; but this difficulty of the connection was involved in both of them—considerably worse in the truck nearest to the windlass than it was in the truck farthest from the windlass. But the Springfield car had also a second windlass, at the opposite end from the windlass which I have referred to, and which, just like that, was connected to the two trucks. But it never got over this difficulty which existed, of producing a variation in the tension of the brakes by the swivelling of the trucks; that remained in it just as much as it did in the old car. And it had another difficulty, which the old brake did not have. The old brakes, being only connected to one truck by one windlass, and to the other truck by another windlass, were each independent of the other, so that no correct adjustment was necessary. But in this Springfield brake, where the two connections were made from the windlass, one to one truck, and one to the other truck, another difficulty arose which was worse than the old brake. It not only rendered it very difficult to adjust these two connections so as to work equally upon a straight line, but when they were so adjusted as to work equally upon a straight line, they could not work equally upon a curved line, and vice versa. That trouble did not exist in the old brake.

I have said that in the braking up of a train of cars it was desirable to apply all the brakes simultaneously, as nearly as might be, and from this it follows that the less number of men that are necessary to brake up a train the better, everything else being equal. And in making this statement, I do not mean to include the expense of the men. It
1331 is better, if the expense is the same, because it is easier to get two men to work in concert than it is to get four men to work in concert, and therefore the Springfield brake was better than the old brake, from the fact that a single individual could apply the brake to the two trucks, where it took two individuals to do the same thing be-

fore; and if this had been accomplished so as to work equally, the Springfield brake would have been a great improvement; but, being coupled with the difficulty which I have mentioned, I do not consider that it was an improvement at all, and I believe that experience has so proved it. And, in fact, for safety, leaving out the expense, I think the old brake is better than the Springfield brake, for the reason that the Springfield brake, although it saves half the men, brings with it other difficulties which are worse than the employment of twice as many men, especially to the passengers that ride upon the road. It is more liable to accidents, and a train cannot be brought up with it, under all circumstances, so quick as it could with the old brake, using twice the number of men.

At the present day the most popular and the most efficient brake is the Westinghouse. The only peculiarities of this brake are, first, that it is operated by a single mind, or at the call of a single mind, without being obliged to signal to others; and, second, that it can be operated uniformly upon all the brakes of the train. The brakes are just the same as they were before; there is nothing new in them; the novelty is in the more ready application of the brakes, and application with greater uniformity. It is more expensive than the old brake, for two reasons: in the first place, it is very costly; in the next place, it is difficult to keep in order, and the brakemen are not dispensed with, because if a train is broken apart, then the Westinghouse brake is entirely useless, as I understand it, and the brakemen have to go to the brake-
1332 windlasses as they did before, and therefore, I believe, they are always taken along on the train, as far as I know; at any rate, they always should be. But it is a great security, because, in case of an emergency, the brakes can be applied at once by the engineer, who is more likely to see the emergency than anybody else; and they can be applied with such uniformity as to make every wheel in the train tell to its utmost; so that a train may be brought up, perhaps, in about half the time, or half the distance, that it could be brought up by the old contrivance; because, although the brakes are the same, they cannot be got on soon enough to prevent the accident. Suppose that by bringing up the train in 300 feet, the accident was avoided, when, if it run 600 feet, it would be fatal. This I understand to be the great benefit of the Westinghouse contrivance; not that the brakes are any different—they are just as they were before—but they are more efficiently worked; more efficiently worked, because they are worked quicker and more uniformly. The Batchelder and Thompson patent describes a swivelling car with eight wheels in two trucks, and a double-acting brake acting upon those trucks; and this is the first contrivance, as far as I know, which avoided, almost, if not altogether, the difficulties incident to the trucks in a car, as they are used in this country, and is the first, as far as I know, to which the Westinghouse improvement has ever been applied. Subsequently to this, there was a modification of this contrivance of Batchelder and Thompson, by Nehemiah Hodge, for which he took letters patent. That modification is susceptible of being used with the Westinghouse contrivance, and is so used. One Stevens also made a modification of this Batchelder and Thompson brake, for which he took letters patent, and this is susceptible of use by the Westinghouse improvement, I believe. But I have never known of this improvement being applied to the Springfield contrivance, and I take it it
1333 would not make a good practical car-brake in any way—in connection with the contrivance or without it. At least, I know of no way by which the Westinghouse improvement might be applied to

it so as to make it a good brake; so that this contrivance of Batchelder and Thompson seems to have been the first which avoided the difficulties incident to the running of cars as they are usually constructed and run in this country, and upon which the Westinghouse improvement could be used. Batchelder and Thompson, by their contrivance as it stands, and as it is described in the patent, being of such a character that good braking could be done by one-half of the men which it was necessary to use in using the old brake, so far as the concentration in a single mind goes, went the first half of the way—they got rid of one-half of the men; and Westinghouse has reduced the other half to a single individual.

Int. 10. You have said, in the answer just finished, that when the old cars with the single brakes passed from a straight track on to a curved track, and vice versa, there was always a difficulty. Will you please state more fully than you have yet done what that difficulty was?

A. By "the old cars" there, I do not mean any other than the eight-wheel cars—because that difficulty did not exist when there were no trucks upon the cars. Now, the windlass being necessarily placed upon one side of the central line of the cars, longitudinally, and it being necessary to make the connection from the windlass to the levers in the truck in a line parallel to the length of the car, or nearly so, in order that the truck levers may act properly, it will be readily understood that any swivelling of that truck round the king-bolt would change the relation of the top of the truck lever—which is attached to the truck—to the windlass which is attached to the body of the car; so that if the car took a curve in one direction, the connection would
1334 be tightened, and if it took a curve in the opposite direction, the connection would be loosened; and therefore it was impossible, so far as I know, to so proportion the parts in any way, when that was the arrangement, as to avoid this difficulty.

Int. 11. You have also stated that the Springfield brake had this same difficulty, together with another difficulty which the old single brake had not. Will you please state how it is that the Springfield brake comes to have this same difficulty, and also please to state what the result in the practical use of the Springfield brake is, in consequence of its having the other difficulty from which the single brake is free?

A. The connection of the windlass to the truck nearest to the windlass was substantially the same in the Springfield brake that it was in the old brake which preceded it; but there was also upon the same windlass the connection to the other brake of the car. Now, it will be seen that without the connection to the other brake of the car, the same difficulty existed in it that existed before in the old brake; and the connection to the second brake mentioned had the same difficulty, though not to so great an extent. And, besides this, there was a further difficulty in the necessity of such an adjustment of these two connections that they might work equally even upon a straight track. Now, if this adjustment was so made as to produce an equal pressure of the brakes upon the wheels when on a straight track, then, when running on to a curve in one direction, the brakes on one truck would be tightened, and on the other would be loosened, because, when one truck turns one way the other truck turns the other way. But suppose the car took a curve in the opposite direction—then the connection which was tightened in the former instance would be loosened in this instance, and the one which was loosened before would be tightened.

1335 Int. 12. Have you a diagram present with which you can illustrate the effect upon the Springfield brake of the passage of the car from a straight track, with the brakes applied, on to a curved track; and, if yea, will you please state the scale of length of car body upon which such diagram is made, and will you state the different radii of curves to which the diagram is applied?

A. I have such a diagram. It is drawn to a scale of half an inch to a foot. The extreme length of the car-body represented in this diagram is 45 feet. The different radii represented are 500 feet, 400 feet, 300 feet, 200 feet, and 100 feet; and one of the drawings represents a car upon a straight track.

Int. 13. Will you, by means of this diagram, illustrate fully what would be the effect in the use of the Springfield brake of the application of the brakes to a car with trucks, when running upon a straight track and then passing from such straight track on to tracks of the different respective radii represented in the diagram?

A. According to this diagram, a car, in passing from a straight track on to a curve of 500 feet radius, varies the relation of the end of the truck lever to the windlass at one end of the car about an inch and a half, so that, by such change, the brake would be drawn tighter upon the wheels of the truck to the extent of what would be due to a turn round the windlass far enough to draw the lever an inch and a half, which would amount to several notches upon the ratchet-wheel as it is usually used upon the brake. The truck at the other end of the car would not be affected quite so much, and whatever it was affected would be by shortening instead of lengthening. This effect I cannot measure quite so accurately as I could the other, because my instruments will not span over the space; but as nearly as I can measure with the scale,
it would be shortened very nearly an inch and a quarter, so that
1336 the variation of both together—one in one direction and the other
in the other direction—amounts to two inches and three-quarters, very nearly. The other curves make the differences more. The extreme one—which I understand to be an extreme representation—where the radius is 100 feet, makes the variation very much larger. It is, in that case, at one end of the car about seven inches and a half that the space is increased between the windlass and the truck lever, and the connection to the other truck is shortened five inches. With the radius of 200 feet, the corresponding measurements are 3½ and 2½ inches, respectively, very nearly. With the 300 feet radius, the corresponding variations are two inches and an inch and a half, very nearly. With the radius of 400 feet, the corresponding variations are an inch and a half—large—or about an inch and five-eighths, and an inch and three-eighths, as nearly as I can make it out.

Int. 14. Will you please state what the various lines and circles upon the diagram are designed to represent, and will you please mark the various parts with letters?

A. If I mark one of these diagrams, it will be sufficient for the whole of them, so far as I have referred to them heretofore, and I will place the marks upon that diagram which represents the straight track. A A represent the lines of the track or rails in the railroad; B represents the body of the car; C C represent the trucks; D D the windlass wheels; *a a* the windlasses upon the shafts, with the windlass wheels; *b b* the king bolts upon which the trucks swivel; *c c* the axles of the trucks upon which the wheels are made fast; *d d d d* the ends of the truck levers to which the connecting rods of the truck are pivoted; *e e e e* the connecting rods.

Int. 15. Upon the scale upon which the figures of this diagram

1337 are made, what is the diameter of the windlass wheels as represented in the various figures?

A. The circular lines which represent the windlasses are 14 inches in diameter.

Int. 16. And what is the diameter of the windlass shafts in the figures?

A. These drawings represent them as about two inches, where the chains wind on them.

Int. 17. I notice that in the figure of the diagram which represents the Springfield brake car as stand on the straight track, the tops of the truck-levers which are denoted in the figure by the letters *d d* are just about over the railroad rails. Please state whether this is the proper position for the tops of said levers when the car is on the straight track?

A. It is about the proper position. The windlass is placed where it is upon the body of the car as represented in this diagram. That position of the windlass was taken from the cars which are running on the Boston and Providence Road, which have upon them the new Springfield brake as recently applied upon that road. These windlasses are placed in about the same position upon the body of the car that they are placed upon those cars.

Int. 18. Please state whether you have yourself seen the Springfield brakes on those Boston and Providence cars, and have measured the distance of the windlass shafts on those cars from the central longitudinal line of the car?

A. Of course I have, or else I couldn't swear that these are like them. And I will also say, in addition to what I have said, that the distance between the rails as represented by this diagram is about four feet, eight inches, or eight and a half, which I understand to be the distance between the rails on the Boston and Providence road, or very nearly that.

Int. 19. How material in the practical use of the Springfield brake would be these variations to which you have testified as exhibited by this diagram?

1338 A. I consider it a grievous fault in that contrivance, and such as to render it valueless for all practical purposes when compared with the brakes of the present day. What I mean by this is, that no road, in my judgment, could afford to use it so long as they could obtain the other brakes for any reasonable compensation.

Int. 20. Will you now, as you have testified to the diagram, bring together in a single answer what you have thus far stated to be in your opinion the comparative advantages, on the whole, of the single brake, in contrast with the Springfield brake on the whole?

A. The comparisons between the old brake and the Springfield brake amount to about this, in my judgment. It is likely that in using the Springfield brake upon a train of cars, the immediate expense to the road would be somewhat less than in using the old brake, because one-half the number of men could do the work, as far as they could do it, upon the Springfield brake. But as an offset to this, I bear in mind the difficulties of adjustment on the Springfield brake. They are very great, from the fact of these extraordinary strains which will at times come upon it, as I have stated, and also from the fact that at the best, when the two brakes are made to act together upon a straight track, the adjustment of the connecting rods must be very accurate. Now, this adjustment will require to be done quite often, and at considerable expense, because men of considerable skill are required to do it, and

this will be so much out of the gain which will be made by using the Springfield brake with half the men. But as a matter of safety, it is likely that so far as the Springfield brake acts correctly upon a straight track, there will be greater safety in using it than in using the other, because there is only half the number of men to do the work,
and can be made to act more nearly simultaneously than
1339 double the number of men. With these differences, I still
should prefer, as a matter of safety, to have the old brake, although the expense might be greater when the old brake is used. In the old brake this necessity of comparative adjustment is done away with, because the two windlasses do not act in common upon the two brakes, and with double the number of men the brakes can be more equally applied, under all circumstances, with the old brake, than they can with half the number of men with the Springfield brake; and I would sooner take the additional expense of the single brake for its greater safety, than take the less expense of [the Springfield brake with less safety.

Int. 21. Have you recently seen any tests made with the Springfield brake which tend to illustrate the conclusions about it above stated by you? If so, where did you see such tests; how was the brake constructed for the tests, and what was the result of the tests? Please answer fully.

A. I have seen such experiments at Providence, on the rails of the Providence and Worcester Railroad, and I believe, also, the rails which are used by the Boston and Providence Railroad, in the yard there. I saw there an old freight car upon which there had been placed recently brakes to represent the Springfield brakes, and I saw that when those brakes were set tight on a straight track, and run from that track on to a curve, the wheels of one truck would take to sliding, and when it passed from that curve to a reverse curve, the wheels of the other truck took to sliding; and, in both instances, the wheels of the truck which did not take to sliding were quite loose under the action of the brakes. I do not mean that they were absolutely free, but I mean that they were so loose that the brakes upon them did little or no good. Those curves were extreme curves, not such as are used in the line of the
road, as I understand it, but they proved what the tendency of
1340 that brake is. I afterwards saw the same car tried upon curves
of larger radius. Both pairs of wheels of one truck did not take to sliding, but one pair of wheels did. This is because, in the truck levers, as usually applied, one pair of wheels is held tighter by the lever than the other pair is in the same truck in all the cars that I know of, except where the Stevens brake is used, and when one pair of wheels in one truck took to sliding, the wheels of the other truck were considerably looser than they should be.

Int. 22. Did you pay particular attention to the mode of application of the brakes to the car in this test, and to the circumstances of the test; and if you did, state whether or not the test was in all respects a fair one?

A. I did; and the test was in all respects a fair one, so far as I know, with the exception that on this old car the windlasses were placed considerably nearer the central line of the car than they are usually placed on the passenger-cars, as I have observed them, and I think some eight or ten inches nearer, as well as I remember, the central line than what the windlasses are upon the Boston and Providence cars, where the Springfield brake is now, I think; and that is not quite a fair representation of the Springfield brake, because, in order to have a convenient car, it would be necessary to place the windlasses farther out, and that would aggravate the difficulties which I have mentioned.

Int. 23. It has been testified in this case, with reference to this test, by M'r Olney L. Smith, the car-master on the Providence and Worcester Railroad, who was present at said test, that the length of the car-body of this car was about thirty feet, over all. Please state how this length of car compares with the average length of passenger-cars in the United States, and whether or not the difference would favor the operation of the Springfield brake?

1341 A. I cannot speak officially as to the length of the passenger cars. My impression is that they are considerably longer than this car which I saw there, and the longer a car is between the king-bolts of the car, the worse the Springfield brake will act upon it.

Int. 24. Is there or not, in the Tanner brake, as represented in the Tanner patent, any provision for avoiding this bad result which you have shown to exist in the old single brake and in the Springfield brake —that is, the effect upon the brakes of the passage of the car, with the brakes applied, from a straight track to a curved track, and vice versa? If there is, please state what it is.

A. There is. The combination and arrangement of the Batchelder and Thompson brake, as applied to a car, and as described in the letters patent, is such that the passage of a car from a straight track to a curve of 100 feet radius will produce very little variation in the relative distances which are occupied by the connecting rods—so that that car can run from a straight track to a curve of 100 feet radius without producing any considerable variation of the tightness of the brakes upon the wheels, and if it can do that, it certainly can do anything that is required of it on common railroads, because, as I understand it, it is not often that there is a curve on the regular track of a railroad so small as a radius of 100 feet—or even so small as a radius of 500 feet, and the greater the radius, the less the variation will be in the requirements of the brake. This is accomplished in the Batchelder and Thompson contrivance by the use of a central lever attached to the body of the car, which is connected at each of its ends with each of the windlasses upon the body of the car. Now, inasmuch as this lever is pivoted to the body of the car, it is obvious that the going from a straight line on to a curve—which only affects the truck—will in no way affect this lever with the windlasses and its connections—which is altogether upon the body of the car. But there is a connection between the central 1342 lever and the truck levers. This connection, however, is made in such a manner that a straight line drawn from the point of connection upon this central lever—which is attached to the body of the car—to the lever which is upon the truck, will pass nearly through the king-bolt upon which the truck swivels; so that when, by means of the swivelling of the truck, the end of the truck lever to which the pivoted connection is made swings, it does not swing lengthwise of the car, but swings crosswise of the car, taking the connecting-rod something out of a straight line in the direction of the king-bolt, first one way and then the other, so as to produce a slight angle in the connections, but not so as to make any considerable variation of the distance from the end of the truck lever to the point upon the centre lever attached to the body of the car to which the connection is made.

Int. 25. So long, then, as the various levers are arranged as they are seen to be in the Batchelder and Thompson patent—so that the line of draft from the centre-lever to the tops of the truck levers is nearly in a line with the king-bolt of the swivelling truck, can there be any variation in the effect of the brakes, when the truck swivels, which will be at all material under any ordinary circumstances?

A. There cannot.

Int. 26. Does this combination and arrangement of the various parts prevent the alternate lengthening and shortening of the connections which you have stated produces so bad an effect in the old single brake and in the Springfield brake?

A. As a mathematical fact it does not, but as a practical fact it does.

Int. 27. Is there any difficulty in the practical construction and application of brakes to eight-wheel cars having trucks, in so combining and arranging the parts of the Tanner brake as to secure these advantages?

1343 A. There is not. The Tanner brake requires that the two connections to the central lever should be so adjusted as that they shall baer equally upon the wheels of both trucks of the car whether they are on a straight line or whether they are on a curved line; and the passage of the car, when so adjusted, from a straight line to a curved line will not make any material change in the relation of those parts, nor will it make any material change in the tightness of the brakes when they are once properly applied.

Int. 28. Can you illustrate this provision of the Tanner brake, and the effect of it, by means of the diagram to which you have already referred? If you can, please do so.

A. The drawing in the patent illustrates that, and this diagram is similar to it. One of the figures on this sheet of diagrams represents the Batchelder and Thompson contrivance upon a straight track, with the brakes applied. The other represents it with the brakes applied upon a track of 100 feet radius, and upon inspection it will be observed that in the position upon the track of 100 feet radius the ends of the brake levers upon the trucks to which the connecting-rods are pivoted is the same distance from the point upon the centre lever to which they are connected as is represented when the contrivance is on a straight track. This will be seen on reference to the points represented at *b b* on figure X, and *a a* on figure Y. There should be, mathematically, a difference here, but the difference is so small it would be difficult to detect it upon a drawing of this size. There is a little error in the drawing, I perceive, so that one of the connecting-rods—say at *b b* in X—is a little longer than at *a a* in X; but it will be obvious that this difference is very small, because it can never vary more, under the circumstances here represented, than what is produced by the change in length from a straight line between the points *a* and *c* in figure Y, to the length of line produced by the angle *a a c* in figure Y.

1344 Int. 29. In the Tanner brake, are the truck levers spoken of attached to the brake bars of the trucks in such a manner that they can vibrate more or less in a direction crosswise of the car when the brake is applied?

A. They are.

Int. 30. What effect, if any, does this have in reference to the equality of the application of the brakes when the car passes from a straight track on to a curve?

A. The effect is to allow the connecting-rod to pull more in a direct line toward the centre of the king-bolt than it would if the lever was rigidly guided in its action upon the truck; so that the swivelling of the truck will actually produce less *less* change in the connecting-rod than what is represented by the diagram.

Int. 31. Referring now to the Hodge brake, please state what, if any provision, that contains for securing a substantial equality of application of the brakes when the car passes from a straight track on to a curve?

A. The Hodge brake can be so constructed as to secure uniformity of tension, or nearly so—uniform for all practical purposes—in the action of the brake-rods when the car passes from a straight line on to a curve. And this is accomplished in a similar manner in the Hodge brake to what it is in the Tanner brake. It is by using levers in the combination that a uniformity may be maintained which could not be maintained without the levers; and it is partly from this, and partly from the fact that the two windlasses—being upon the right-hand side of the passage-way of the car—are so situated that there is a compensation between the two trucks by means of the use of those levers. When one swivels towards its adjacent windlass, the other swivels away from its adjacent windlass.

1345 Int. 32. How nearly, then, may the tops of the truck-levers of the Hodge brake draw in line with the king-bolt of the swivelling truck, when the brake is applied and the car passes from a straight track on to a curved track, and vice versa?

A. The Hodge brake may be so constructed as that the draft will be nearly in a line with the king-bolts; how nearly I am unable to say.

Int. 33. Can the Springfield brake cause the draft of the truck levers to be thus nearly in line with the king-bolt when the car passes from a straight-track on to a curve?

A. No—so long as the windlass wheel is outside of the passage-way from car to car.

Int. 34. Can the Stevens brake be so constructed that the levers in the trucks, or either of them, will draw nearly in a line with the king-bolt of the swivelling truck when the car with the brakes applied passes from a straight track on to a curve?

A. Not so well as the Hodge brake can; but something of it can be and is accomplished as the Stevens brake is usually constructed, where the windlasses are one upon one side and the other upon the other side of the passage-way between the cars.

Int. 35. Which of the levers in the respective trucks of the Stevens brake will have the most tendency to draw nearly in a line with the king-bolt under the circumstances named?

A. Not one more than another. In the Stevens brake the line of draft is direct between the windlasses, I believe, crossing the central line of the car about at the centre of the car.

Int. 36. Will you state whether you can illustrate by another diagram sheet the comparative variations of the truck levers of the Springfield brake and the Tanner brake, when the brake is applied to a car on a straight track, and the car then passes from a straight track on to a curved track of a radius of 800 feet, and vice versa? And if you can, please do so.

1346 A. That is the same illustration which I made in regard to the Springfield brake and the Tanner brake with the greater curvatures upon the first diagram sheet; and I have had drawn here, side by side, the Tanner brake and the Springfield brake, upon a curve with a radius of 800 feet, as nearly as it could well be done. The comparative character of the two brakes will be the same, whether the curve be large or small, but, of course, the difference will be less, because the variation is less when the radius of the curve is large. I do not mean that it will be less in proportion, but I mean that the difference will be less, because the variation of each car is less. In both of the diagrams here now for the first time presented the scale is one inch to the foot, instead

of half an inch to the foot. The proportions of the cars are represented here substantially the same that they were in the other drawing, and in both these diagrams the trucks of the cars are represented as swivelled about to the extent due to the curve of the track; both the same. It will be seen by a comparison of these diagrams that the swivelling of the truck produces a variation, geometrically, in the Springfield car substantially in a right line with the connections; while the same variation of the swivelling of the truck in the Tanner contrivance is substantially at right angles to the lines of the brake connections; so that, whatever variation there may be in the Springfield car by the swivelling of the truck requires that the connections should vary equal in amount to the variation due to the swivelling. In the Tanner brake—the way the proportions are drawn here—this amount of variation will make the short leg of a triangle, instead of being communicated directly to the connections; so that, if the variation due to the swivelling of the truck be half an inch at each truck in the Springfield car, the whole change of relative position of the ends of the truck levers to which the connections are ap-
plied will be one inch, and the greatest geometrical change which
1347 can be made in the Tanner contrivance under the conditions sup-
posed will be equal to the difference in length between the points *a*, *b*, *c*, and the points *a*, *e*, *c*, when added together, in both instances. The difference from *e* to *b* will be just the same as the actual change of length due to the swivelling between the points *e*, *f*, and also between the points *e*, *g*, respectively. This is the geometrical effect in the Tanner contrivance and in the Springfield contrivance; but in the Springfield contrivance the movement, being directly in the line of connection, is absolutely communicated to the parts so as to produce a greater tension of the connections, while in the Tanner contrivance the floating of the truck lever will destroy what geometrical difference the diagram exhibits, as I have explained, and the brake connection will not be perceptibly tighter than it would upon a straight line.

Int. 37. Can you state what will be the amount in inches of the variation of the truck levers in the Springfield brake under the circumstances represented in this diagram sheet?

A. I believe a more perfect solution of the problem can be obtained by a proposition in the plain rule of three than can be shown by these diagrams made upon this scale. It is not in the nature of these diagrams to afford accurate measurements when they are upon a small scale, but figures will not lie. If the proposition is suitably put down, then the result can be obtained exactly by the figures. It is obvious that in the running of the truck of a car upon the curve of a railroad a radial line, when drawn so as to pass through the king-bolts of the trucks, will be parallel to the axles of the driving-wheels if the car is properly constructed. It is also obvious that if a radial line be drawn between the two king-bolts, at equal distances from them, that line will be at right angles to the body of the car. Now, suppose that a radial line is repre-
sented by the dotted line *g h*, passing through the king-bolts of
1348 one of the trucks, and another radial line is represented by the
dotted line *i j*, and that the dotted line *k l* represents a radial line through the centre of the body of the car, at equal distances from each king-bolt. Now, it is obvious that these several radial lines will all come together at the same point. And again, if a line be drawn from centre to centre of the king-bolts, it will cut the radial line *k l* at right angles at *m*. Now, supposing *n* to represent a centre to which the sweep of the track is concentric, where these several radial lines come together, then the three points, *m*, *n*, and *o*, at one of the king-bolts,

will be a right-angled triangle. And the distance between the axes of the king-bolts, according to these diagrams, is about 37 feet; so that the distance from *m* to *o*, which is the distance from the centre of the car to one king-bolt, will be about 18½ feet. Now, the two radial lines *k l* and *g h* and the lines *m o* form, altogether, as I have said before, a right-angled triangle—the line *o h* to *n* being the hypothenuse, the line *m l* to *n* being the long leg of the triangle, and the line *m o* the short leg of the triangle. Now, taking the distance from *m* to *n* as the radius of the curve, which will be sufficiently near, then that line will be 800 feet; so that the lines *o g* to *n* and the lines *m k* to *n* converge 18½ feet in 800 feet; or, what is the same thing, they diverge 18½ feet in 800 feet. Now, going out from the king-bolt at *o* to the connecting-rod at *p*, the distance, as represented by this drawing, will be two feet and a quarter. It is obvious that, in going this two feet and a quarter, the lines *m k* to *n* and *o j* to *n* will diverge in the same proportion through that distance. So that it is a fair proposition to say that if, in going 800 feet, these lines diverge 18½ feet, how far will they diverge in going two feet and a quarter? Taking these three terms and finding the fourth, that fourth will represent substantially the variation in the connecting-rods which go from the 1349 windlass to the brake levers upon each truck, for it will be substantially the same at the other end of the car as it is at the end of the car where I have made the line *g*, *h*, only it will be in the opposite direction. This leaves out of view some change of angle in the connecting rods, which will be considerable on the short connecting rod in the Springfield car—showing the reason why there is more variation than in the other of the connecting rods; the shorter one showing the greatest variation because, in swivelling, it not only shortens, but changes the angle of the line of connection considerably upon the short connecting chain. And then the proposition will stand as follows: 800 : 18.5 : : 2.25 : *x*. Then *x* will represent the change of tension in the connecting rod due to the swivelling of one truck, and there will be substantially the same change in the other truck; so that 2*x* will represent the variation of difference between the points of the levers upon the swivelling trucks, when they pass from a straight line on to a curve, and vice versa. Now the variation, according to this formula, will be .62375 of an inch, for one truck, and the same for the other truck, making, for the variation of both trucks, twice that—namely, 1.24750, or about an inch and a quarter.

Int. 38. This being the amount of variation for a car with the Springfield brake upon it properly adjusted for a straight track, when with the brake applied in a proper manner upon such straight track it passes on to a curve of 800 feet radius, how material will said amount of variation be in respect of its effect upon the brakes of a car, and what, in your judgment, will be the result upon the wheels of the car?

A. If the brakes are set as tight as they can be set upon a straight line without sliding the wheels, and then the car be run on to a curved track of a radius of 800 feet, the wheels of one of the trucks will slide, of course, and the wheels of the other truck will be considerably 1350 loosened under the pressure of the brakes. I understand that the windlasses upon this Springfield car are about an inch and a half in diameter, (meaning by "windlass" the barrels upon which the chain winds); and this will be in proper proportion to a windlass of three inches on the Tanner brake—when the connections are made to the central lever half way between the ends of the levers and the fulcrum. Now a windlass an inch and a half in diameter will be about 4.7 inches in circumference and the amount of variation which I said would be due to the trucks, if multiplied by 7½, would be about equal to the circumference of the drum or barrel upon which the chain was wound in the Springfield car. And if we divide 360 degrees by 7½, we get 48 degrees, so that the variation in the swivelling of the truck will be equal to about 48 degrees in the revolution of the windlass, which is something over one-eighth of a revolution; and the variation of the other truck would be the same; so that, both together, the variation of the two trucks would be equal to 96 degrees, which is six degrees more than one quarter of a revolution of the windlass wheel.

Int. 39. But I understand you that under the same circumstances the Tanner brake would not be perceptibly affected?

A. It would not.

Int. 40. In one of your answers some time since you spoke of the fact that in the Tanner brake there is greater power applied to one pair of wheels in each truck than there is to the other pair in the same truck. Please state why this is, and whether or not there is in this respect any difference between the Tanner brake and the Hodge brake.

A. This is because the brake levers having three pivots—one at the lower end of the brake attached to one brake beam, the next one above
the lower end of the brake attached to the other brake beam, and
1351 the top of the lever is jointed to the connecting rod—the power
applied to each of these brakes is in proportion to the length of this brake lever—from the connecting point at the top hole to the bottom hole for one arm of the lever—when compared with the distance between the hole at the bottom and the next hole above it for the other arm of the lever; while for the other pair of shoes, the long arm of the lever stops at the hole between the upper and lower end of the lever—the other arm of the lever being the same as it was before; and therefore the variation of the power will be as the variation of the distance from the top hole to the central hole—as compared with the distance from the top hole to the lower hole—when put in relation to the distance between the central hole and the bottom hole, which is always common to both. So that if the brake lever be 36 inches long from centre to centre of the outer holes, and six inches long from centre to centre of the two lower holes or fulcrums, then if 100 pounds be applied to the top of the lever, the effect produced upon the brake beam connected with the lower hole will be 400 pounds; the effect upon the other will be 500 pounds.

The Tanner brake and the Hodge brake both contain this difference between the two pairs of wheels in each truck.

Int. 41. Going now to the Tanner brake and the Springfield brake, please state which of these two brakes requires the most power to be exerted by the brakeman at the brake wheel to convey a given amount of force to the brakes, assuming that the diameter of the windlass wheels, and of the part of the windlass shafts on which the chain winds, and the long and short arms of the brake levers, are the same in each brake, and that in the Tanner brake the connections from the windlasses to the centre lever are at the ends of the centre lever, and the connections from the centre lever to the truck levers are ten inches from the end of said centre lever, and that the centre lever is four feet long.

1352 A. The Springfield brake.

Int. 42. How much more power?

A. The proportion is as 16 on the Springfield brake to 24 on the Tanner brake, so that if 100 pounds be applied to the windlass of the Springfield brake, of course just 100 pounds will be exerted upon the brake levers, because the connection is direct. But in the Tanner brake the connection is not direct—it is through a centre lever having a long arm in that centre lever 24 inches, and a short arm 14 inches; so that if the same amount, to wit, 100 pounds, were applied to the windlass, it would communicate to the ends of the truck levers 171 pounds and a fraction; in both cases one-half the amount going to each truck.

Int. 43. Now compare the Springfield brake with the Hodge brake as to this point, assuming the same data as in the next preceding question but one, but assuming that the connections of the Hodge brake are made as they ordinarily are.

A. In the Hodge brake, if 100 pounds be applied to the windlass, the same number of pounds will be applied to each of the brake levers—so that there will be 200 pounds applied to the two brakes in the Hodge contrivance, when there are only 100 pounds in the Springfield brake. In all these calculations, I leave out the friction.

Int. 44. Now taking the Tanner and the Hodge brakes, assume that the leverage is made the same in each brake, and that both brakes are properly adjusted and in order; what, if anything, will be the difference between the two, in respect of their power to hold the car when the brakes are applied?

A. There will be no difference that I know of; but if the leverage be made equal, the connection between the truck levers and the central lever of the car body must be just half way between the connection of that central lever with the windlasses and the pivot of that central lever upon the body of the car.

1353 Int. 45. In view, then, of all the facts you have herein stated, what, in your judgment, constitutes the advantage possessed by the Hodge brake over the Tanner?

A. The advantage of the Hodge brake over the Tanner consists in the fact that there is no relative adjustment to be maintained in the brake connections. The levers used in the Hodge contrivance between the windlasses and the brake levers having no connection with the body of the car, float into the position required so as always to produce an equal strain upon each of the two trucks when the brakes are set up. This will not be the case in the Tanner brake unless the connections from the centre lever to the truck levers are adjusted to a suitable length—the one with the other. In consequence of this difference, the Hodge brake will bear much greater neglect of adjustment than the Tanner brake.

Int. 46. And I understand that you find no other difference between the two brakes than this?

A. I know of no other important difference between them.

Int. 47. At page 196 of the Defendants' Accounting Record in this case, it has been testified by M'r Robert Hitchcock that "a brake applied as now seen in Defendants' Exhibit Large Tanner brake" (which he had stated was the same as applied in the Patent Office model—meaning the Patent Office model of the Batchelder and Thompson invention,) "would not be a practical operative brake as applied to a railroad car"; and said Hitchcock further testifies, on the same page, that the reason of this is that "it applied too much power, and required the use of too much chain." Will you please state whether or not there are any, and if any, what, means of rendering the brake operative notwithstanding the thing referred to in said answer?

A. If the windlass in the Tanner brake be made proportionately too small for the leverage obtained by means of the central lever, then
1354 the brake may be faulty, because there will be danger of the brakeman applying too much power; but there is no difficulty in the Tanner contrivance arising from increasing the leverage upon the centre lever, provided the size of the windlass be proportionately in-

creased—the windlass wheel always remaining the same in both cases. By "windlass" I mean that part upon which the windlass-chain winds.

Int. 48. In connection with this subject, please look at the drawing of the Tanner patent and state what the six holes in the centre lever—three on each side of the centre-pin—indicate.

A. I understand them to indicate that the connection of that central lever with the truck levers can be made at different points, according to the judgment of the constructor.

Int. 49. Is there anything in the specification of the Tanner patent to limit the constructor to any particular point of attachment of the truck lever connections?

A. There is not.

Int. 50. At page 188 of said Defendants' Accounting Record, the same M'r Hitchcock testifies to a certain experiment as follows: "We took a car with the Tanner brake applied the same as on Exhibit 123. We went to a point marked by a bridge, using 120 pounds steam-pressure. We had a brakeman, a helper, and myself. We attained the highest speed that we could in running a certain distance which was marked by a switch; we estimated the speed at twenty-five miles an hour. At this switch we sounded the whistle; the brakeman was at his post, the man ready to draw the pin simultaneously, and the brake was applied—first with the Tanner brake as it now stands in that exhibit. We ran, I do not know how many feet, but we marked the place where we
1355 stopped. We then converted the brake into what is termed the old single brake, by disconnecting the lever of one truck from the centre lever. We went over the ground again, all things being equal, and stopped very nearly in the same place; I think we passed about somewhere in the neighborhood of the length of the car further. We were surprised ourselves in one sense; and we tried the experiment again in the same way, with just about the same results. We then coupled it up, making the Tanner brake good again, and went over the ground once more. The same instructions were given to the brakeman in each case, and all the conditions the same, and about the same results were obtained that we did with the first trial of the Tanner brake."

He also says, page 189, "the law of generating friction is as the pressure, not as the surface pressed on," and that in the said experiment "when operated as a single brake, the wheels slid a little ways. The brakeman was a common man, not acquainted with applying brakes. All that he could do was to exhaust his force upon the windlass. If he had, at the point where the wheels began to slide, let up on his chain, I think that the result would have been the same as with the Tanner brake, or nearer than it was. I became satisfied that if a man exhausts his force upon a single brake and does not slide the wheels, he does just as much service as he does when he exhausts his force under the same conditions on the double brake, not sliding the wheels."

Please state your views of this experiment, and give your reasons for your answer.

A. I do not see anything delusive in this. It appears to me
1356 that, taken as a whole, there is no delusion in it. If I understand him, he says that in a certain experiment, using both trucks, using the same brakeman, and as nearly as might be the same power applied to the windlass—a car was brought up in about the same time; and he says the law of generating friction is as the pressure, not as the surface pressed on. That is correct. He says further: "I became satisfied that if a man exhausts his force upon a single brake and does not slide the wheels, he does just as much service as he does when he exhausts his

force under the same conditions on the double brake, not sliding the wheels." I think that is correct. But it is clear that if this brake was so arranged that he could not slide the wheels of a single truck upon a car when applying it, when it was applied to both trucks the pressure upon each truck was only half what it ought to be. In other words, if the same pressure had been applied to the brakes in each truck in one case that was applied to the single truck in the other case, then the car would have been brought up in a little more than half the distance when using both brakes.

Int. 51. You say "in a little more than half the distance." Please state the reason why it would not be brought up in half the distance.

A. The reason why it would not be brought up in half the distance is because the friction of the journals upon their boxes is in addition to the brakes in braking up a car, and a large part of that friction is due to the weight upon the car. This is independent of the brakes, and the further the car runs the more there will be of this friction; so that in order to bring up the car it would have to run more than half the distance, because the friction upon the journals due to the weight upon the car would only be used the distance the car run, and not the whole distance run in the first instance referred to when only one truck was used. So that if there was any delusion on the part of M'r
1357 Hitchcock, it was in supposing that this was a fair test, going to show anything instructive in relation to the braking up of a train of cars; for if it proved anything, it proved that one truck in a train of cars was enough to have brakes upon it, leaving all the other trucks to go without any brake; because if one brake is as good as two for the purpose of bringing up a train of cars, then it is as good as four or sixteen, or any other number, which is simply absurd.

Int. 52. At page 189 of said Defendants' Accounting Record, the same M'r Hitchcock is questioned and answers as follows:

"Q. In applying friction to car-wheels for the purpose of stopping the car, are the wheels ever made to slide when the car is at high speed?

"A. No, sir; that is impossible.

"Q. When do they, if ever, slide?

"A. When the car is nearly at rest."

Please state the views entertained by you on this subject.

A. I do not consider it impossible to slide the wheels of a car when the train is going rapidly, and it certainly is not possible to slide the wheels of a car when the train is not going at all. There is something in this idea of M'r Hitchcock's, which is not all a mistake. It is more difficult to bring the brake-shoes to hold tightly upon the car-wheels when they are turning rapidly. I think, with the same amount of strain upon the brakes, the shoes will not hold as much when the car is in rapid motion as they will when it slows its motion somewhat. If the shoes be put on tight enough, the wheels can be slid at any rate of motion; there is no doubt about that. I have said in the course of this examination that the bite of the wheels upon the rails was the only available force to be employed for bringing up a train—the same as it is the only available force to be employed for putting a train in motion;
1358 the difference being that in bringing up a train it is usual to use the wheels of the cars, while in putting a train in motion it is usual to use the wheels of the locomotive. Now, if it is true that the wheels will not hold well upon the rails when they are sliding, it is just as true that the brake-shoes will not hold as well upon the wheels when they are moving as they will when they are at rest; and therefore,

everything else being equal, the less the rate of revolution of the wheels, the tighter the brake-shoes will hold—or in other words the more they will act to retard the revolution of the wheels. But it is always necessary, in order to brake up a train, that the shoes should be put upon the wheels when they are in motion, because when they are not in motion the train is not in motion. I recollect that in the early working of the Western Railroad, as was then reported, a freight-train in going down the steep grade into Springfield had not upon it sufficient brakemen to hold it, and it ran away in spite of the brakes; whereupon the engineer reversed his engine and put on so much power as to run his wheels in the opposite direction, and it was then reported that this train went down under those conditions, went across the street, through the shops of the company, and some portions of it, I believe, into the river. Now, it is more than likely that this same engine could have drawn that train up that grade, but it could not hold it from going down, in addition to the brakes which were upon it. It was because the engineer put absolutely too much steam upon his machine in the first instance, and then kept it on there—thereby destroying the bite of the wheels upon the rails to a very great extent, jumping off himself, as well as I remember, and leaving the train to go down. Now, it is likely if this engineer had had the necessary presence of mind to have let the steam more gradually into his cylinders, maintaining the bite of the driving-wheels upon the rails, he might,
1359 in doing that, in addition to what the brakes could do, have held
that train. So this braking up of a train is a mixed problem. But notwithstanding that, it is undoubtedly an axiomatic fact that in order to bring up a train of cars in the least possible distance, it is necessary to put the brakes upon every wheel in that train, and not only to put them on, but to keep them on with such an amount of pressure as shall come as nearly as possible to sliding the wheels on the rails—without sliding them.

Int. 53. At page 189 of Defendants' said Accounting Record, the same M'r Hitchcock was asked and answered as follows:

"Q. You will now please look at 'Defendants' Exhibit Large Tanner brake 123,' and wind up the larger windlass until the scales in each truck indicate 48 pounds, and set down the dog in the ratchet. [Witness did as directed.] You will now take 'Exhibit round scale' and apply it to the periphery of the wheel, and state how many pounds it takes to lift the dog from the ratchet.

"A. Two pounds.

"Q. You will now disconnect one of the truck-levers from the centre lever, thereby resolving the brake into a single brake, and turn up the smaller or twelve-inch windlass wheel until it indicates 48 pounds in the truck to which the windlass is attached. [Witness complied with the request.] You will now apply to the periphery of said wheel 'Exhibit round scale' and state how many pounds it takes to relieve the dog in the ratchet.

"Two pounds.

"Q. What conclusion do you deduce from the facts elicited by the two experiments?

"A. That the power transmitted through a 16-inch wheel upon
1360 a double brake is equal to the power transmitted through a 12-
inch wheel to a single brake.

"Q. Then is it proper or not to conclude that no more power can be conveyed to a single truck by a 12-inch wheel than to the brakes of two trucks by a 16-inch wheel?

"A. It is proper."

Please state whether you have recently been at Springfield, Mass., and there seen the exhibit referred to in this quotation, and whether you have with said exhibit made a test to ascertain how many pounds were required to lift the dog from the ratchet, and if you have, state whether the answers in said quotation given by said Hitchcock as to the number of pounds are correct, and state what was the result you obtained in said test, and give your reasons for your answer.

A. I have been to Springfield, and there saw an exhibit which I was told to be—and which I suppose was—the same as the one upon which M'r Hitchcock says he made the experiment. I tried that experiment myself upon the model. I did not obtain the same results which M'r Hitchcock says he did. My recollection of it amounts to this: that with the small wheel, the power necessary to actually move the windlass in its journals was something considerably over two pounds, and with the large wheel something considerably less than two pounds—which ought to be true, provided the journals of the windlasses—and the windlasses—of the two are equal and alike, which I believe they are. If they are equal, it is, in my judgment, absurd to suppose that double the result will be produced with the large wheel that can be produced with the small one, the wheels being comparatively of the sizes mentioned. If one wheel were as large again as the other, then it might be and should be true, without a doubt. I found upon trial with that contrivance that it was quite easy to be deceived in regard to it. I found that if
1361 the wheel was first pulled with the steelyards so as to move, the steelyards might afterward be let off considerably before the windlass would retreat under the pressure of the springs below—in both windlasses; and that it was quite easy to hold the windlasses at a state of rest, the round scale marking two pounds in both cases. This is because it takes a great deal more power where friction is involved to produce a movement of the parts than it takes to hold the parts in place when the movement has been produced. It will be readily understood that the matter of friction involved is to be added in one case and subtracted in the other. That is, when the movement is to be produced, the power required must be sufficient to overcome the opposing power and move the parts—added together; but when it is simply to hold the thing in position, the friction may be subtracted from the opposing power, and still the parts remain in position. So that the scales may mark in the two cases a difference equal to double the amount of the friction, and in this case all that variation might be produced, and still the dogs which hold the ratchet would be loose in both cases. I think it is in that way the mistake was made.

Int. 54. You have said that if one wheel were as large again as the other, you would get double the result. Please explain this more fully.

A. I do not know any way to explain it. It is like the proposition that two and two make four. It is very difficult to explain how I know it; I know it is so. If I understand M'r Hitchcock, he says that in one case he put upon the windlass of the truck 48 pounds upon one scale and 48 pounds upon another—which makes 96. In the other case, he put upon the windlass 48 pounds only. Now, it is perfectly obvious that in order to move the 96 pounds by means of a lever applied to the windlass in one case, and to move 48 pounds by means of a lever applied
1362 to the same windlass in the other case—the power applied to the lever being equal—he requires a lever twice as long in one case as he does in the other. There is no doubt about that.

Int. 55. Is it, then, or not, proper to conclude—as M'r Hitchcock does—

that no more power can be conveyed to a single truck by a twelve-inch wheel than to the brakes of two trucks by a sixteen-inch wheel?

A. I don't know whether it is proper for M'r Hitchcock or not; it is not proper for me, because I know better.

Int. 56. It has been testified by several of the defendants' witnesses in said Defendants' Accounting Record, that some months ago a car, having upon it the Tanner brake, and also a car having upon it the Springfield brake, were put in the same train on the Boston and Albany Railroad, running from Boston to Albany—the Tanner brake-car being the rear car of the train one day and the Springfield brake car being the rear car the next day; that the brake-shoes of these two cars were made of, as nearly as could be, the same metal, were cast from the same puddle of iron, were of the same pattern, and were put on new at the same time; and that when these brake-shoes were worn out, the respective sets of them were weighed and it was found that the loss of metal from wear with the Tanner brake-shoes was 76 pounds, and with the Springfield brake-shoes 77 pounds.

Please state whether or not in your judgment these alleged facts prove anything in reference to whether the two brakes had operated during the period of the experiment in an equally efficient manner, and give your reasons for such answer as you may make.

A. I do not think it proves anything as to the efficiency of the brakes. It would be quite easy to produce the same amount of wear, using the brakes in one case uniformly upon both the trucks, and in the other case using the brakes first upon one truck and then upon the other, alter-
nately; but when using them upon one truck only, putting them
1363 on with considerable more power than when using them upon two
trucks.

Int. 57. When you were at Springfield did you observe the large models there known in this accounting as "Defendants' Exhibit Large Tanner brake 123," and "Defendants' Exhibit Large Springfield brake 124"? and, if you did, state whether those models were, in your judgment, correct and fair representations, in all respects, of the devices they purport to show; and if not, state why not.

A. I suppose I saw the models inquired of. One of them, as I understand it, was the same one we have just been talking about—on which the scales were used; the other one, as I understand it, was made to represent the Springfield brake. They were not, either of them, correct models in all respects. In the model representing the Tanner brake, the connection from the central lever to the truck-levers was not the same as described in the Tanner patent; and in the Springfield brake, the connection from the truck-levers to the windlass is not the same as was in the old Springfield brake. The windlass in the model representing the Springfield brake, is not located in the same relative position that it was in the car having on it the Springfield brake.

Int. 58. What effect, in the use of the Springfield brake, would be produced by placing the windlass upon an actual car in the same relative position that it is in said model?

A. The effect would be to modify a grave fault which exists in the Springfield brake.

Int. 59. What is the fault to which you refer?

A. The variation of the brake connections by the swivelling of the trucks. And another effect would be to bring the windlass so as to interfere with the passage-way through a train of cars, fore and aft.

Int. 60. Would, then, placing the windlass as it is in said model be admissible in a passenger-car designed for use?

1364 A. It would not.

Int. 61. You have said that in the defendants' Tanner model the connections from the centre-lever to the truck-levers are not made as in the patent. Please state in what respect they differ.

A. In the different position of the ends of the truck-levers to which the brake-rods are pivoted. In the Batchelder and Thompson or Tanner brake patent, the end of each truck-lever—where the connecting rod is jointed to it—is nearly in a line between the king-bolt and the point to which that same connecting-rod is jointed to the central lever of the car. In the model it is very much to one side of that line, so as actually to produce a difficulty in the swivelling of the truck which would not exist when constructed according to the description in the patent.

Int. 62. And would this difficulty which would exist in a brake constructed and arranged like said model tend to an unequal application of the brakes when a car, having the brakes applied, passed from a straight track on to a curve?

A. It would.

Int. 63. If, however, the combination and arrangement of the levers of the brake were as represented and described in the Tanner patent, so that the draft from the centre lever to the truck-levers was nearly or quite in a line with the king-bolts of the swivelling-trucks, would there be any inequality upon the trucks when the car, with the brakes applied, passed from a straight track on to a curve, and vice versa?

A. No appreciable inequality would take place in that case.

Int. 64. In respect of this matter of equality of pressure as between the trucks of the car, is there or not any difference between the Tanner brake, when constructed and arranged as represented in the patent, and the Hodge brake?

A. No appreciable difference, when the Tanner brake is in order.
1365 It is more difficult to keep it in good working order than it is to keep the Hodge brake in good working order.

Int. 65. In securing this equality of pressure as between the two trucks in the Tanner brake, what office do the tops of the truck levers perform?

A. They float sideways, so as to accommodate themselves to the line in which the connecting rods will draw between the king-bolts and the points upon the central lever to which the connecting rods are pivoted.

Int. 66. It has been testified in this accounting record, on the part of the defendants, that the brake represented in "Defendants' Exhibit old tender brake" has for many years been in use upon the tenders of locomotives upon the Western Railroad—now the Boston and Albany Railroad. Please state whether you understand the form of Springfield brake known in this case as the tender brake? And if yea, state what, if any, bearing the use of said brake on locomotive tenders has upon the question of the value of the form of Springfield brake which has been referred to in your deposition as used upon passenger and other long cars.

A. I believe I understand that tender brake. I believe it is substantially the same brake as was on the old Springfield car which has been testified to. But I don't think it has much bearing upon the value of that brake when used upon long cars—because the tender is a very short car, and a passenger-car is a very long car, for one reason; and this difficulty which exists in the Springfield brake is very much greater in a long car than it is in a short one—everything else being equal. Another reason is, that upon tenders a brake is not much used, while upon passenger-cars it is or should be always used whenever it is desirable to brake up a train.

Int. 67. Please state which brake—the Springfield brake or the Tanner brake—contains the most parts requiring adjustment?

1366 A. The Springfield brake—twice as many, without going into particulars. There are two pairs of connecting rods to adjust in unison in the Springfield brake, and only one pair in the Tanner brake.

Int. 68. Which has the most parts requiring adjustment—the Springfield brake or the Hodge and the Stevens brakes?

A. The Springfield brake.

Int. 69. Which brake—the Springfield or the Tanner—requires the most nicety of adjustment, and why?

A. The Springfield brake—for the reason that there is between the windlasses and their connections with the truck levers no intermediate lever, while in the Tanner brake there is an intermediate lever—which may yield somewhat to the variation of strains upon the brakes.

Int. 70. Does the presence of this intermediate lever in the Tanner brake impart to that brake considerable elasticity in use, as compared with the Springfield brake?

A. If you mean by "considerable" that it is better for that elasticity, I should say yes. That lever is not, and should not be, very much elastic.

Int. 71. Is there or not any elasticity to speak of in the Springfield brake? And if not, why not?

A. There is none between the windlasses and the truck levers, because the rods pull in a right line. All the elasticity that can be there is what may take place by the flopping of the rods up and down.

Int. 72. You have spoken in this deposition of the effect upon the Springfield brake when a car with the brake applied passes from a straight track onto a curve, and vice versa. Will you state what effect this action of the brake, under these circumstances, would naturally have upon its action when used on straight tracks?

A. It tends to disturb the adjustment; because if the brakes
1367 are drawn as tight as they should be upon a straight line, and
then the car passes upon a curve, so as to draw the connections considerably tighter, the tendency is to displace the parts in some way—either by bending the levers, or by forcing some other part about the car to yield. And it also tends to wear the shoes more than it should wear them—provided the wheels do not take to sliding. If they do take to sliding, it tends to destroy, to a great extent, the braking power of the car, and also to the spoiling of the wheels.

Int. 73. It has been testified in this accounting record that a brakeman, when setting the Springfield brake, "felt a sharp yank," and that "the brake-wheel went right away from him and threw him against the car railing." Please state what, in your judgment, would in the Springfield brake tend to produce such an effect as this.

A. Passing from a straight line to a curve, before the dog was brought to bear upon the ratchet so as to hold the windlass.

HERVEY WATERS.

Cross-examination waived.

Deposition of Edward Lang, taken at Boston, Sept. 24, 1872.

Direct examination by M'r Sayles:

Int. 1. What is your name, age, residence, and occupation?

A. Edward Lang. Age 47. Residence Boston. Occupation, car-inspector on the Boston and Providence Railroad.

Int. 2. How long have you been car-inspector on the Boston and Providence Railroad?

1368 A. I have worked there since 1847, and have been car inspector since 1854.

Int. 3. Has the Springfield brake been put on some of the cars of the Boston and Providence Railroad within the last six or eight months?

A. It has.

Int. 4. And the Tanner brake also put on a car?

A. Yes, sir.

Int. 5. How many cars have had the Springfield brake put on them?

A. Two.

Int. 6. What are the numbers of those cars?

A. 40 and 12.

Int. 7. How many have had the Tanner brake?

A. One.

Int. 8. What is the number of that car?

A. 10.

Int. 9. Whose duty is it to keep these cars in order, and see that the brakes are adjusted properly?

A. That is my business.

Int. 10. How often has it been necessary to adjust the brakes on these three cars you have mentioned?

A. Well, the Springfield brake requires to be adjusted about every day; the brakemen say so much about it I have to look at it. I should think the other—the Tanner brake—not quite so often; perhaps twice a week. Since these brakes have been put on, we have had more talks about adjusting than we had with the Hodge brake, usually.

Int. 11. Which of the brakes—the Springfield or the Tanner brake—requires the most adjusting—that is, which requires the most labor to adjust it each time it is adjusted?

A. The Springfield brake, for the reason that they have double rods. They have two rods on each truck, whereas the Tanner has one.

Int. 12. Which of the two brakes requires the nicest adjustment?

1369 A. Well, for that reason, the Springfield brake does.

Int. 13. You spoke of there being complaints about the brakes being adjusted, &c. How often, since these brakes have been on that train, have you heard complaints about their not working well?

A. Almost every day, every time I saw the brakemen, which is about every day. They wanted them taken off as soon as possible. [I told them if they wanted them taken off they must go to the superintendent. I had no power to do that. All I was put there for was to keep the cars in good running order, adjust the brakes, &c.]

Int. 14. What has been the nature of their complaints?

A. Well, that they couldn't stop the train.

Int. 15. And you say these complaints have occurred almost every day since these brakes have been on the cars?

A. Yes, sir.

Int. 16. How long have they been on the cars?

A. Well, I should say, though I don't seem to remember much about it, I should say about four months.

Int. 17. A number of months, any way?

A. Yes, sir.

Int. 18. Have you recently measured the levers in these three cars?

A. I have. I measured them the latter part of last week.

Int. 19. What is the length of the truck-levers on these three cars, No. 40, No. 12, and No. 10?

A. The whole length of the levers on one of the cars with the Springfield brake is 34 inches, and also the Tanner; and I find that on the other car with the Springfield brake the long arms of the truck-levers are three-quarters of an inch longer. The lower fulcrum is six inches from centre to centre, and then I measured the upper one 28 inches more.

1370 Int. 20. You say, then, that on one of the Springfield brake cars, the levers are just the same as they are in the Tanner brake?

A. Yes, sir.

Int. 21. What do you think would be the effect, supposing all of the cars on the Boston and Providence Railroad that have the double brakes on now, had on the Springfield brakes?

A. Well, it don't seem as though we could get along. I suppose we might, but it would be pretty hard work to get along so without braking our cars. We should have to have more help, certainly, to keep the brakes in order. As brakes are now, I suppose it is almost impossible to think of getting along with a brake like that, because the Hodge brakes are so much better.

Int. 22. Has the business of the Boston and Providence Railroad increased very much during the last few years?

A. Well, it has increased double within the last ten years certain, and perhaps thribled, or more, since I have been there, according to the number of cars. We have got three or four times as many as we had when I first went there.

Cross-examination by M'r Whipple:

Cr. 1. At the time the Springfield brake was put upon two cars of the Boston and Providence Railroad, was there also a Tanner brake put upon one car?

A. Yes, sir.

Cr. 2. Thereafter did you hear any complaint from the brakemen as to the operation of the Tanner brake in holding the car?

A. Well, those two brakes on those cars were spoken of. All that was said to me was, that they didn't like them so well as they did the Hodge brake, the old brake that had been on the cars that was taken off; the brake that these replaced.

1371 Cr. 3. Did the brakemen give any preference to the Tanner brake over the Springfield brake?

A. Well, I haven't inquired of them with regard to the two brakes. They would simply come to me and want to know how long those brakes were going to stay on, and I would tell them I didn't know anything about it. I hadn't anything to do about their being put on.

Cr. 4. Did they complain as much about the Tanner brake as they did about the Springfield?

A. There wasn't any particular brake spoken about.

Cr. 5. Then, if I understand you, the complaint was as much against the Tanner as the Springfield?

A. Well, all they said was, they wanted to know how long before those brakes were going to be taken off. I never questioned a brakeman with regard to his preference for either brake, so I can't say what their preferences were.

Cr. 6. Then, if I understand you, the complaint was quite as general against one as the other. Was it or not?

A. Well, that is all I have to say. They spoke about those brakes on the cars, and wanted to know when they were going to be taken off.

Cr. 7. Did they mean by "those brakes" the Tanner and Springfield brakes?

A. The brakes that were on those cars, both of them.

Cr. 8. What cars? Give the numbers.

A. 10, 12, and 40.

Redirect by M'r Sayles:

Int. 23. Was the Tanner brake used on all or nearly all of your passenger-trains a number of years ago, and for a number of years?

A. When I first went to work for the company, some of the 1372 cars had the Tanner brake on. We put the Tanner brake first on those cars that we used most. We used a single brake. I have used a single brake myself. And afterwards that was connected with the Tanner brake. That was the best thing I ever saw to connect the brakes together.

Int. 24. Do you know about what year the Tanner brake was put on the cars?

A. Well, I can't say how many cars had the Tanner brake on when I first went there, but I should say in 1847. I probably helped to put the Tanner brake on some of the cars.

Int. 25. And after that it was put on all the passenger-cars?

A. Yes, sir. The Tanner brake was all the brake we had in those days.

Int. 26. And about how long was it continued on the road?

A. Well, five or six years after that; somewhere along there, as near as I could judge. I can't tell near enough to make any positive statement about it.

Int. 27. Was it continued on until the company adopted the use of the Hodge brakes?

A. Yes, sir. That is the brake we took off and put the Hodge on.

Int. 28. When the Tanner brake was in use on that road, did it work well?

A. Well, we didn't have any fault found with it that I know of. I don't remember of any. It required a little nicer adjustment than the Hodge. The brake used to hold well enough. For that reason we used to have to adjust it a little nicer than we do the Hodge.

Int. 29. But with that exception, it used to hold well enough?

A. Yes, sir. We didn't know anything different in those days.

1373 Recross by M'r Whipple:

Cr. 9. Was there ever applied to the passenger-cars of the Boston and Providence Railroad a brake which operated both trucks by means of a revolving shaft upon which pulleys were attached, with grooves in them?

A. Yes, sir.

Cr. 10. To what extent was that brake applied to passenger-cars on that road?

A. Well, we had it on, I guess, perhaps half our cars at one time. There was a man by the name of Miller, who was a pattern-maker for M'r Griggs, who suggested that idea. But we found in going round curves it twisted the shaft and threw it out of order. It was almost impossible to keep it in order for that reason.

Cr. 11. Was this brake applied to the passenger-cars of that road before the Tanner brake or single centre lever brake was applied?

A. No, sir; the Tanner brake was the first.

Cr. 12. How long after the Tanner brake was applied, in 1847, did ou apply the brake spoken of in the previous question?

A. Well, four or five years after that. I should say five years.

Cr. 13. Have the tenders of the locomotives on the Boston and Providence Railroad double trucks?

A. No, sir; I think we have a few tenders with double trucks, but as a general thing there are six wheels under the tenders.

Cr. 14. On those that have double trucks, are the brakes operated through a revolving shaft with wheels on the same?

A. I can't say with regard to that. I don't know much about their tenders. I have very little cause to do much with them, unless they
break a chain or something of that kind, over in town, and then I
1374 have it repaired for them. I know they used to put that revolving
shaft under their tenders, and used it later than they did under their passenger-cars.

Cr. 15. Did they use this revolving shaft under the passenger-cars until they substituted the Hodge brake?

A. There might have been cars there with that on when we adopted the Hodge brake.

Cr. 16. Then for a time the cars were equipped either with the Tanner brake or with this revolving-shaft brake, were they?

A. Yes, sir.

Cr. 17. And finally both gave place to the Hodge brake?

A. Yes, sir.

Redirect by M'r Sayles:

Int. 30. Are you certain that any of these revolving-shaft brakes were on the cars up to the time the Hodge brake was adopted?

A. Well, I couldn't say, but I think there were.

Int. 31. Which was the best brake, the revolving-shaft brake or the Tanner brake, for passenger cars?

A. I do not consider the revolving-shaft brake a practical brake now, because we have discovered that we cannot get round a curve with it; it would disarrange it. But it was on the road some little time before I discovered it. I found the brakes were disarranged—for what cause I couldn't tell, until I perceived that those shafts, which had been made square, were twisted. What I mean to say is, we had some shafts made round and some square, and with a round shaft you couldn't see so easily that it was twisted as you could with a square one. Come to inquire into it, I found that was the trouble. In going round a curve, something had to give; either the chain would break or the shaft twist. The in-
ference would be, of course, that the Miller brake would not an-
1375 swer, for that reason. I consider the Tanner brake the best, for
that reason. Going round a curve, that would disarrange.

Int. 32. What do you mean by "that?"

A. The Miller brake, of course.

Recross by M'r Whipple:

Cr. 18. How sharp a curve did it require the car to be run round in order to disarrange the Miller brake?

A. I can't say about that. Almost any curve where the brakemen applied the brake on the curve.

Cr. 19. Are there any sharp curves, so called, on the Boston and Providence Railroad where brakes are applied on the main line?

A. I can't say. I am not well enough acquainted with the road to know where their curves are. A brakeman is liable to set a brake on any curve, if there is anything in the way—if he is called to do so.

Cr. 20. Was the twist of the shaft in the Miller brake due to an excessive strain by the application of power from the brake-wheel?

A. Well, I don't know how to answer that question any more than to say that a man couldn't twist it on a straight track. If he should apply it on a curve, the curve would help him to twist it. His strength would not be enough to twist it on a straight track, but when he went round the curve and applied it he would have so much more power.

Cr. 21. What month in the year 1847 did you commence work on the Boston and Providence road?

A. The 19th day of October.

Cr. 22. At that time you found the single centre lever or Tanner brake in use on cars of that road, did you?

A. I think I did.

1376 Cr. 23. Any doubt in your mind about it?

A. No doubt.

Cr. 24. How many cars compose the train in which the cars having the Springfield brake and the Tanner brake on are run?

A. Five.

Cr. 25. What brakes are on the other two cars?

A. The Hodge.

Cr. 26. How often do you have to put new shoes on cars having the Springfield brake and Tanner brake on?

A. Well, sir, I can't say as they have ever had any new shoes put on.

Cr. 27. Has neither the Springfield brake nor the Tanner brake come to shoeing since it was run on the road?

A. I can't say. I haven't paid any particular attention to that matter, and have not looked at it.

Cr. 28. Do you apply the shoes to cars when they need them?

A. Yes, sir.

Cr. 29. And you have no recollection of applying any new shoes to either the Springfield brake or the Tanner brake since they were put on?

A. No, sir; I don't put the shoes on myself. I have too much to do to put shoes on. My men do that, and that is a matter I should not be likely to know much about—that is, unless I paid particular attention.

Cr. 30. So you know nothing about the shoeing of either of the brakes?

A. No, sir.

Cr. 31. How many cars should you judge had the Tanner brake on in October, 1847, when you came on to the Boston and Providence road?

A. It would be almost impossible for me to look back and think. I can't tell anything about it. I was young in those days in railroading.

1377 Cr. 32. How many, according to your best recollection?

A. We didn't have but very few cars then. I can't say how many cars we had. I should say—my best recollection would be—perhaps a dozen.

Cr. 33. What was the weight of cars at the time the Tanner brake and Miller brake were used on that road compared with the weight at the present time?

A. Well, according to my judgment, perhaps cars are a third heavier now than they were then, and perhaps some of them are more than that.

Cr. 34. Are they not, as a general rule, more than as heavy again?

A. I think our sleeping-cars are. Our sleeping-cars are the heaviest cars we have got. But we had some long cars in those days that held seventy-six passengers, and then we had short cars that held sixty, as we have now. We don't use the cars that hold seventy-six passengers much now; we have only one or two, I think, that we keep as spare cars.

Cr. 35. Was the centre-lever and Miller brake applied to those heavy cars?

A. I have no recollection about that; I can't say.

Cr. 36. Who were the brakemen who complained to you about the Tanner brake and the Springfield brake?

A. Well, M'r Rogers is the man who came to me individually and spoke about their being taken off.

Cr. 37. What did he expect to be put on in place of them, if they were taken off?

A. The Hodge brake.

Cr. 38. Are you applying the Westinghouse air-brake to the cars of that road?

A. Yes, sir; putting it on all the cars.

Cr. 39. Was it not for the purpose of getting that on these cars that he wanted the Springfield and Tanner brakes taken off?

1378 A. No, sir; merely the Hodge brake put back the way it was before. That probably will come in time when the superintendent orders it on.

Cr. 40. How long since M'r Rogers requested you to take them off?

A. Since the trial at Springfield. He said it was all over now, and he supposed there was no further use for them; but I told him I couldn't do anything about it until I had orders.

Redirect by M'r Sayles:

Int. 33. You speak of "the trial at Springfield;" what do you mean by that?

A. Well, after he came from Springfield he called it the trial; I don't know what it was; but after he came from Springfield he said it was all over, and he supposed they didn't want the brakes on any longer, and he wanted them shifted.

Int. 34. Had he been to Springfield?

A. Well, I supposed so by that; yes, sir.

Int. 35. What had he been to Springfield for; did you learn?

A. No, sir, I did not; I don't remember; something in regard to the brakes.

Int. 36. About how long ago was it that he said this to you about the trial at Springfield?

A. Well, say a fortnight. That is just merely my judgment; I don't profess to tell dates exactly.

Int. 37. Might it not have been some time in August when he spoke about the trial being over at Springfield?

A. I can't say. I know it was after he came from there that he spoke about it. It is now the 24th of September. It might have been in August or might have been in September—the first of September; I have no recollection. I shouldn't want to state definitely the time.

Int. 38. You say it was after he returned from Springfield?

1379 A. Yes, sir; that is all I can say. It was after he returned from Springfield.

(Deposition read to the witness.)

Int. 39. Do you authorize the reporter to sign your deposition?

A. Yes, sir.

EDWARD LANG.

Deposition of E. L. Wallace, taken at Boston Oct. 12, 1872.

Direct examination by M'r Sayles in person:

Int. 1. Please state your name, age, residence, and occupation.

A. E. L. Wallace; age, 36; residence, Boston; occupation, locomotive engineer on the Boston and Albany Railroad, Worcester division.

Int. 2. How long have you been engaged in railroading, and in what capacities?

A. Twenty years. I commenced first working in the shop; then fireman; then engineer.

Int. 3. About how long were you fireman, and for whom did you fire?

A. Well, I fired for different ones, but I fired for M'r Hobart on the express-train the longest. I fired for him about five years.

Int. 4. While you were fireman for M'r Hobart do you remember of a peculiar kind of brake being put on to the New York line cars, called the Springfield brake?

A. Well, I don't recollect the name of the brake. I didn't know it
was called the Springfield brake until you were speaking about
1380 it; but I recollect the circumstance about a brake being bought
by M'r Twichell and put on there. [Answer read.] Oh, I made
a mistake there.

Int. 5. Just state what correction you wish to make.

A. Well, these Springfield brakes that the Western road put on we were all afraid of when we had them on; and in case of a flag or any accident happening to us we were all afraid of the train. We couldn't stop the train. Well, we would run—I won't state how far, but so that we couldn't stop. We had to reverse the engine and do all in our power to stop it.

Int. 6. You speak of M'r Twichell's buying a brake. Was it before this brake that you speak of that you couldn't stop a train with was used, or after, that M'r Twichell bought the brake?

A. After.

Int. 7. About how long was this brake that you say you were afraid of, that you couldn't stop a train with, used?

A. It was used about a year, I think.

Int. 8. What was it you spoke of that M'r Twichell bought the right to use?

A. I heard that M'r Twichell bought the right to use it on the Western road, that is, between Springfield and Worcester—that is, the Hodge brake. After we got them we were safe.

Int. 9. What brake was used on the Boston line cars before and after this brake that you were afraid of was used?

A. I don't recollect.

Int. 10. Was it the same one you used afterwards?

A. I think it was.

Int. 11. What train were you fireman on at the time these Springfield brakes were used?

A. The morning express, which left Boston at half past eight.

Int. 12. Boston and New York express?

1381 A. Boston and New York express.

Int. 13. About how long ago were these Springfield brakes used on the Boston express line cars?

A. I can't state positively, but I think in the year 1856 or 1857.

Int. 14. How long have you been engineer on the Boston and Albany Railroad?

A. Fourteen years.

Int. 15. And what train are you running now?

A. The three o'clock Boston and New York and Albany express.

Int. 16. While using the Hodge brakes, was there any difficulty in making your stops at stations?

A. No, sir.

Int. 17. What position did M'r Twitchell occupy on the road at the time he bought the Hodge brake for the Western road, as you have stated?

A. He was president of the Boston and Worcester Railroad. He took Judge Hopkins' place, I believe.

Int. 18. Were the Springfield brakes taken off and the Hodge brakes put on soon after M'r Twitchell bought the right of Hodge?

A. I believe they were.

Int. 19. Will you authorize the reporter to sign your name to your deposition?

A. Yes, sir.

E. L. WALLACE.

Deposition of Oramel A. Brigham, taken at Boston, Oct. 12, 1872.

Direct examination by M'r Sayles in person:

Int. 1. Will you state your name, age, residence, and occupation.

A. Oramel A. Brigham; age, 41; residence, Lowell; occupation, depot-master on the Boston and Lowell Railroad, at Lowell.

1382 Int. 2. Do you or not have charge of the cars at Lowell?

A. I do.

Int. 3. Do you remember of the Sringfield brake having been put on a train of cars on that road some months ago?

A. I do.

Int. 4. Are they still used on the cars on that train?

A. That I can hardly tell, the cars are changed so. Those cars have been in the shop and perhaps the brake has been taken off. The cars have been in the paint-shop, and when they go in there they stay for some time, so we have not had our regular cars. I can't swear whether they are off or on. My impression is that they are not on.

Int. 5. You think, then, they have been taken off?

A. I do.

Int. 6. Did you run as conductor on that train at all while those brakes were on?

A. I did.

Int. 7. While you ran as conductor on that train, how did the Springfield brakes work in stopping the trains?

A. They did not work well. We ran by the stations.

Int. 8. Did or not the brakemen complain very much of their not working well?

A. They did.

Int. 9. Did you or not often hear the brakemen who ran on that train complain of them; all the time while those brakes were used on that train?

A. I did, with the exception of when they had been adjusted; and that did not last but a short time.

Int. 10. What do you mean by the short time that they were adjusted?

A. What I mean is, that the adjustment did not last but a short time.

1383 Int. 11. (By M'r Whipple.) Then they worked well, so far as you know, while they were adjusted?

A. While they were adjusted they worked very well.

Int. 12. (By M'r Sayles.) Do you remember a trial of a week to see what stops could be made on the road with those brakes?

A. I do.

Int. 13. How often during that week were the brakes adjusted?

A. That is what I do not know.

Int. 14. What did you learn at the time with regard to their being adjusted that week?

A. I had the impression that they were adjusted at Boston here every time they came in at the car-house.

Int. 15. (By M'r Whipple.) You don't know anything about it?

A. I can't testify to that positively, sir.

Int. 16. Is it merely your impression?

A. That is it.

Int. 17. (By M'r Sayles.) Did you learn so from those who were on the train at the trial—the conductor or brakemen?

A. I heard the brakemen speaking of it. (Defendants objected as hearsay.) As I said before, I know nothing of it that is positive at all.

Int. 18. You mean by that you did not see it done?

A. I did not see it done. I don't want to testify to anything I don't know is so, because we have got men enough who know it.

Int. 19. Did you mean, when you spoke of the brakes being adjusted, during that week that that trial was?

A. No, sir; I did not mean that. It was when the brakes got to working bad; they couldn't hold the cars with them; and they
1384 would complain of it to the master mechanic, and have him go and set the brakes up, or adjust them.

Int. 20. You said they would not stay adjusted long?

A. No; they proved they didn't.

Int. 21. Who were the brakemen on this train when you were conductor on it?

A. George B. Granger and M'r Wing, the same man you had out at Springfield. Alpheus Wing, I think his name is.

Int. 22. (By M'r Whipple.) Did you understand that M'r Sayles had Alpheus Wing out at Springfield as a witness?

A. No; I mean the man who was out there. I don't mean to say that M'r Sayles had him out there, because that I don't know anything about.

Int. 23. (By M'r Sayles.) At the time of this week's trial of these Springfield brakes, who were the brakemen on the train?

A. Alpheus Wing and John D. Emerson.

Int. 24. Were they regular brakemen at that time?

A. No, sir.

Int. 25. How did they come to be on that train during that trial?

A. Because they were Blood's old brakemen previous to this, and were put on there because they were good brakemen.

Int. 26. (By M'r Whipple.) They had operated the Springfield brake before?

A. They had broke with this same brake for a long time. They had been Blood's brakemen for a long time.

Int. 27. (By M'r Sayles.) Who ordered them to go there and brake during that week's trial?

A. That is what I don't know positively, as I never saw any order.

Int. 28. Was braking their regular business at this time?

A. Not at this time.

1385 Int. 29. Had they, or not, been promoted some time before this—one as conductor and the other as assistant depot-master?

A. Yes, sir; both of them.

Int. 30. And had been acting in their new capacities for some time before this trial of a week?

A. I think so.

Int. 31. Who would have been the right one to order them from their positions to brake on that train?

A. M'r Winslow, the superintendent.

Int. 32. Do you know whether it was understood that this trial was to be made and the result proved in this case by M'r Blood and the brakemen?

A. I never knew what the trial was made for at the time the trial was made; and at the time they went to Springfield I did not know what they were going for. I knew they were going to testify in this case, but what for I didn't know.

Int. 33. Was it understood that they were to go and testify in this case before this trial was made of a week?

A. I think it was.

Int. 34. When you were conductor, did you, or not, notice that the brakemen worked very much harder in applying these Springfield brakes than when they were applying the Hodge brake?

A. I did.

Int. 35. And they would then often run by the stations, would they not?

A. They would.

Int. 36. Did they often run by the stations when they had the Hodge brake on?

A. No, sir. But at the same time the boys would say, if the brake was adjusted they could hold them.

Int. 37. Were the brakes generally out of adjustment?

A. I think they were.

1386 Int. 38. On the whole, did you consider the Springfield brake a safe and reliable brake for railroad purposes?

A. I do not know enough about brakes to answer that question strictly.

Int. 39. It is only your opinion that is asked for?

A. I do not consider it as safe a brake as the Hodge brake.

Int. 40. With the experience you have had on railroads, all I want to know is whether you consider that a safe and reliable brake for fast passenger-trains?

A. I do, if they are well adjusted. I make that answer because we proved, when they were on that trial, that they could stop the train, and I know that train runs as fast as any train we run.

Int. 41. Take the brakes in the condition in which they generally were while you were running on that train, did you consider them safe and reliable?

A. Well, if we did not consider them so we should not have run them on the train, I suppose.

Int. 42. About how long is it since they discontinued the use of those brakes?

A. I don't know. We never had them on any train, that I know of, except that Blood's train. I don't think those brakes have been used since the trial—not much of any. I don't think they have, but I don't state that as a thing that I know.

Int. 43. Would M'r Wing and M'r Emerson have acted as brakemen on that train during that week's trial without an order from M'r Winslow, the superintendent?

A. They would have acted as brakemen by an order from the depot-master here, M'r Piper; but M'r Piper would have had his orders from M'r Winslow, so that really it came from him, I suppose.

O. A. BRIGHAM.

1387 *Deposition of A. G. Batchelder, taken at Boston, Oct.* 12, 1872.

Direct examination by M'r Sayles in person:

Int. 1. What is your name, age, residence, and occupation?

A. My name is A. G. Batchelder; age, 52; residence, Lowell; occupation, manufacturer.

Int. 2. Are you one of the inventors of what is called the Tanner patent car-brake?

A. I am.

Int. 3. Soon after you invented this brake, did you or not apply the brake to a car or cars on any railroads in Massachusetts? If so, on what roads, and when?

A. I applied it on a car on the Fitchburg Railroad, in October, 1847, and also on the Lowell and Boston Railroad, in Lowell, in June, 1848.

Int. 4. Where did you locate the truck-levers when you applied the brake to these two cars you speak of?

A. I placed it inside the truck frame, back of the king-bolt—placed upright, so that the top of the lever would vibrate either way.

Cross-examination by M'r Whipple:

Cr. 1. How many cars did you apply this brake to on the Lowell road?

A. One.

Cr. 2. How long was that in use on that car?

A. I believe they ran it until some time in the fall of the same year.

Cr. 3. How long did they run the car on which you put the brake on the Fitchburg road with said brake?

A. Well, I don't know of my personal knowledge—only what I was told by M'r Thompson, one of the inventors. He had charge of it after I put it on.

1388 Cr. 4. What did he tell you?

A. Well, it was some time after. He told me he ordered it off by some misunderstanding or something—some trouble he had with some of the men on the road.

Cr. 5. Then you did not put it on, if I understand you, yourself?

A. I did.

Cr. 6. Did you give up the charge of the brake thereafter to M'r Thompson?

A. I did—on that road. He was living there at the time.

Cr. 7. Are you pecuniarily interested at the present time in the Tanner brake patent, so called?

A. I suppose I am.

Cr. 8. To what extent?

A. I have a certain interest in the extension.

Cr. 9. How large an interest?

A. I don't know as that has anything to do with this case.

Cr. 10. Do you refuse to answer the question?

A. If it is essential to the testimony in this case, I will answer it.

Cr. 11. Have you a half interest?

A. That is bordering on my refusal.

Cr. 12. Have you a quarter interest?

A. That is the same.

Cr. 13. Have you a tenth interest?

A. That is also the same.

Cr. 14. Have you any interest at all?

A. I have.

Cr. 15. On what other roads did you apply the so-called Tanner brake, besides the Lowell and the Fitchburg?

A. Not any.

Cr. 16. What you have already stated constituted your entire efforts in the way of introducing the same on railroads?

1389 A. I made some other efforts, as I have testified, in the beginning of this suit.

Cr. 17. What efforts; please name them?

A. I believe they are in print.

Cr. 18. If they are, please repeat them?

A. Well, I consider it introduced itself, after I made those trials. It soon found its way on other roads, as I found, by seeing them on those cars, I suppose. I had no reason to believe that it got on the cars in any other way than by seeing them on these that I put them on to.

Cr. 19. Then, if I understand you, the putting of the brake upon one car on the Fitchburg road and one upon the Lowell road constituted the sum and substance of your efforts to introduce the brake to the attention of railroad companies?

A. Well, we did a good many things; all we supposed we could do, or that it was possible for us to do at that time.

Cr. 20. Well, what things did you do more than is stated in the question?

A. Well, we employed others to get it introduced.

Cr. 21. Who were they?

A. Well, M'r Heath and D'r Bellows.

Cr. 22. What did these men do towards introducing it?

A. Our greatest trial was to get a patent out during all this time; therefore, we didn't probably try as hard as we should if we had had a patent.

Cr. 23. Then there was nothing done in the way of introducing it until you got a patent, other than you have already named, on the Fitchburg and Lowell roads; is that so?

A. Nothing that I remember of in particular.

Cr. 24. And even on those roads it was used but a short time; is that so?

A. On the Lowell road they used it until it was ordered to be
1390 taken off by M'r Winslow in order to put on some other kind of
brake. It was a spare car.

Cr. 25. What other kind took the place of it?

A. M'r Hodge's.

Cr. 26. Do you consider the Hodge brake a better brake than the Tanner brake?

A. I consider it an improvement.

Cr. 27. In that sense, do you mean that it is a better brake for operating a car, or holding the same?

A. I do not consider that it would hold a car any better—no further than it equalizes the force on the wheels—than the Tanner brake.

Redirect by M'r Sayles in person:

Int. 5. Did you travel on M'r Blood's train while the Springfield brakes were used; and, if so, about how often?

A. I made several trips to Boston on his train during April, May, and June, 1872.

Int. 6. When did you first know the Springfield brake on that train?

A. Somewhere about the middle of April.

Int. 7. Did you notice how the train was stopped at the stations?

A. I took notice that they usually ran the length of them by the stations; not every time, but a great many times.

[Int. 8. Did you or not hear the conductor or brakemen speak of the Springfield brakes, whether they worked well or badly, at any time?

A. I have heard the conductor, M'r Blood, speak of them several times. Up to the week's trial that he had, he always spoke against them.

Int. 9. Please state what you heard him say with regard to the Springfield brakes.

1391 A. He couldn't see why they were using that kind of a brake, when it was not so good as the Hodge brake. He didn't see into it. He thought that they could not get up the power that they got with the Hodge brake.

Int. 10. Did you or not hear him speak of those brakes a short time before the week's trial they had, to see what kind of stops they could make; if so, what did you hear him say?

A. On Saturday before the week of trial I talked with him concerning the brakes. He said he was having his train all adjusted right, and was going to make a week's trial of it for the purpose of seeing how good time they could make, or what it would do—I don't know the words he used, but that was the idea—for the purpose of testifying in the case.

Int. 11. Did he say where he was going to testify?

A. Springfield, Mass.

Int. 12. Did he at that time say what brakemen he was going to have?

A. He said he was going to put on his old brakemen, or have on his old brakemen.]

Int. 13. Have you often travelled on the train between Lowell and Boston when the Hodge brake was on?

A. I have.

Int. 14. Did you notice, when the Springfield brake was used, whether the brakemen worked as hard or harder than when they applied the Hodge brake?

A. Well, I have always noticed the working of the brakemen at the wheel, and I never saw them work as hard before as they did on the Springfield brake. Sometimes two of them would get hold of one wheel—one time, I noticed—in order to stop the train at a station.

A. G. BATCHELDER.

1392 *Deposition of Wesley R. Batchelder, taken at Boston, Oct.* 12, 1872.

Direct examination by M'r Sayles in person:

Int. 1. State your name, age, residence, and occupation.

A. My name is Wesley R. Batchelder; age, 29; residence, Lowell; occupation, clerk.

Int. 2. How often do you travel between Lowell and Boston?

A. Every day, down and back.

Int. 3. Have you ever traveled on conductor Blood's train since last October; if so, about how often?

A. From one to six times a week.

Int. 4. Did you know what brake was used on that train during this time?

A. I didn't know the name of it, or what it was called, until, I should say, the middle of June. I knew there was a different brake there from what had been, but I didn't know by what name it was called.

Int. 5. Did you notice the working of that brake?

A. I did.

Int. 6. How did it work in stopping the trains?

A. Well, sometimes it worked as well as any brake; at other times they would run by and back back. I don't think I ever saw it, though, more than five or six times when I was on the train.

Int. 7. You never saw it run back more than five or six times?

A. Back back more than five or six times.

Int. 8. Would they usually stop where they ought to at the stations, or run partially past the stations?

A. Yes; they would usually stop at the stations where they ought to. As I said before, it was only in a few instances that I saw that they did not stop. Not being a constant rider on that train, of course I
1393 didn't see the workings of it as much as I should if I had been.

Int. 9. Did you notice the brakemen's working on the train—whether they worked hard to apply the brakes, or as they did when they used the Hodge brake?

[A. I did in one instance, in particular, in the case of a brakeman, when I was in the smoking-car. He came in, and, as he sat down, he drew a long breath. I spoke to him and asked him if he was tired. He replied that he was. "These new brakes," was his expression, "are awful hard." I asked him what he meant by new brakes. He said there was a patent on the old brakes, for the use of which the owner had demanded a very large sum of money, and, as he understood it, the railroad company had put this on to show that they could use a brake and not pay him for his brake. I then told him, from seeing his hands so badly calloused—he could hardly open them straight or close them up tight. I think they were the worst calloused hands I ever saw. I suggested to him that he buy a pair of thick leather gloves, and a few days after that I saw him with the gloves on, and told him I was glad he had adopted my suggestion. He said, yes, he had, and thanked me for making the suggestion to him. In another instance, after this conversation with him, I asked M'r Emerson, the other brakeman, how they worked, and he replied that he was in the employ of the railroad and didn't want to say either way; that his bread and butter depended on his work, and if he didn't say anything he should not have anything to prove.

Int. 10. Did this brakeman say how his hands came to be so calloused?

1394 A. Well, because this brake was so much harder to operate—that was what he said.

Int. 11. Was this brakeman M'r Wing?

A. This brakeman was M'r Granger, who took M'r Emerson's place. M'r Emerson took Wing's place when he was promoted, about the first of July, and Granger was put on in Emerson's place. I had seen Granger on other trains. He was a spare brakeman before he was put on this train.

Int. 12. What, if anything, did you ever hear M'r Blood say about the working of these brakes?

A. I heard him—I should think it was late in the winter or early spring—he was in the depot, and the superintendent, M'r Winslow, and another gentleman stood there talking and pointing under the cars, and Blood soon stepped up to them and seemed quite excited, and I heard him make this remark: "I don't care a d—n. I have got just as good brakemen as there are in the world, and you give me a good brake and I will stop the train, if you will allow me the leverage of it, as quick with one hand as any man you can put on this train with this brake—I don't care if he weighs a ton"—meaning the brake they were growling about that was on the train at that time.

Int. 13. What brake was this they were growling about?

A. It was this brake which I afterwards found was called the Springfield brake.]

Int. 14. Who were the brakemen on this train at this time?

A. Wing and Emerson.

Int. 15. How long did they continue as brakemen on that train, if you know?

A. M'r Emerson was put on to the new train, as conductor,
1395 which leaves Lowell at five minutes past seven in the morning,
the last of May or first of June. I think that was put on about the last of May. The time-tables were changed about that time. Blood then run an express down, making only four stops, while Emerson's, five minutes later, was accommodation, and made all the stops, and they have so continued up to this time.

Int. 16. Do you know whether that Springfield brake is on that train now?

A. No, it is not, and has not been since about the middle of August.

Int. 17. What brake is on it?

A. The old Hodge brake.

Int. 18. On the same cars that had the other one on?

A. I am not positive about the baggage-car; but passenger-cars No. 1 and No. 2, and smoker No. 63 are Blood's regular cars; he has run those for a long, long while; but the baggage-car, which is No. 22—I don't know whether that had the Springfield brake on or not. That is the car that is running now and has been running for some time—three or four months.

Int. 19. While this Springfield brake was on Blood's train, were there any cars run in the train that had other brakes on; if so, what kind of brakes?

A. Blood left Lowell every morning at seven o'clock, and then ran to East Woburn, sixteen miles, and there attached two cars which came from Stoneham, and then ran two miles further to Winchester, and there attached four or five cars—almost always four—and brought them into Boston. At night he takes out those same cars, with the Hodge brake on (they always had the Hodge brake on) and drops them off where he takes them on in the morning, and then runs to Lowell with cars all
having the Springfield brake on. From East Woburn up, sixteen
1396 miles, after Emerson's train was put on in the morning, he had
no stop to make from Lowell until he got to East Woburn, where he put on the first Hodge brake.

[Int. 20. What was it that you say Blood seemed to be excited about?

A. I don't know. I came into the depot, and two gentlemen stood there, and Blood stood a little distance from them, and I should judge from the conversation that he had had something to say about it before, because he spoke right up again and made some remark. I didn't stop to listen to the conversation, but stopped a moment or two because I saw John was talking, and then stepped into a car and took my seat. I was conductor on the Concord and Lawrence road for a short time, and since that time I have noticed more about the cars than I ever noticed before in my life.

Int. 21. Did you ever hear M'r Blood say anything about these brakes on any other occasion?

A. I have heard him say that he has "blowed about them to the super." That is his expression.

Int. 22. Has he ever said anything to you as to whether he liked them or disliked them?

A. He has given me to understand a great many times in the early summer that he did not like them by any means.]

W. R. BATCHELDER.

Cross-examination waived.

1397 *Deposition of Charles Flagg, taken at Boston, Oct. 22, 1872.*

Direct examination by M'r Sayles:

Int. 1. Please state your name, age, residence, and occupation?

A. My name is Charles Flagg; age, 50; residence, Worcester; occupation, locomotive engineer on the Boston and Albany railroad.

Int. 2. How long have you been a locomotive engineer?

A. Eighteen years this fall.

Int. 3. How long in your judgment would it require to stop a train of four cars on a level road, where you had two first class brakemen and such brakes as have been used on the Boston and Worcester road for a number of years, and running 26 miles in an hour and five minutes, making say five stops? What in your judgment would be a fair average time of stopping from the time you shut off the steam until the train came to a stop?

A. Well, I should say, with a good rail and brakes in good order, they ought to stop in thirty seconds; it should not exceed that time. I should say that it ought to be done in that time, at any rate. That would be my judgment of the thing now.

Int. 4. Would it or not make a good deal of difference in stopping a train where it was understood there was a trial being made to see what stops could be made—in that case it is supposed that the brakemen would always be at their post? In that case would or not thirty seconds in your judgment be plenty of time to stop the train in on an average?

A. Well, I should say on an average they would do it, on a trial so.

1398 Int. 5. On the same road supposing they run the 26 miles in an hour and twelve minutes, making from thirteen to seventeen stops, what in your judgment would be a fair average time of stopping from the time steam was shut off until the train came to a stop?

A. Well I don't know. I should say, to make their time, they could not lose any more time in stopping. Still, they would have to use a little more speed. I suppose they would have to use a little more time to stop, and they would have to increase their speed.

Int. 6. The question is, how much time would be required for the stops in order to make the time?

A. I should think your speed would be enough faster to make ten seconds difference in your stops. You have got to make shorter stops; then you have got to stop quicker because you have got to run at a higher speed, and you have got to stop quicker, if you do it as quick as you did in the other case. The quicker you run, of course the longer it will take to stop.

Cross-examined by M'r Whipple:

Cr. 1. Do you wish to be understood that to the thirty seconds in a previous answer you would add ten seconds, making forty seconds—as your answer to the last question?

A. Well, I don't know but I might have made that a little different in this way; I don't know the exact thing; if you are going to increase the time according to the number of stops you make, you have not got to use any more time to stop. I don't know how it is—I haven't thought it over to know—as you figure—just in that way. I think you said an hour and five minutes in the first place to go 26 miles and make five stops. Now, if you are going in an hour and twelve minutes and make sixteen or seventeen stops, you are making twelve more stops in seven
1399 minutes more time. Well, you are not increasing your time a minute to a stop. That you can't do. You can't make a stop and start at any station in a minute. You must know that you can't stop a thing going forty miles an hour as quick as you can if it is going thirty, unless you run it against something that is solid—that won't move. That is the ground I go on. If it takes me thirty seconds to stop in going thirty miles an hour, if I have got to increase my speed ten miles an hour it will take me longer to stop.

Cr. 2. Do you mean by that that it takes ten seconds more added to the thirty?

A. No, I should not think it ought to take ten seconds exactly; but I think it would take five seconds certain.

Cr. 3. Which, added to thirty, makes thirty-five seconds?

A. Yes, sir.

CHARLES FLAGG.

Deposition of Wesley R. Batchelder (recalled), taken at Boston, Oct. 23, 1872.

Direct examination by M'r Cozzens:

Int. 1. Will you please state whether, since you were examined here on the 12th of October, 1872, you have become able to state any more accurately than you then did when it was that you first knew that the brake called the Springfield brake was on certain cars of M'r John C. Blood's train on the Boston and Lowell Railroad? If so, please state as nearly as you now can when it was.

A. It was the last of April this year, 1872—instead of the first of June that I first knew it.

1400 Int. 2. Over how long a period after this time—the last of April, 1872—did these trips which you made on M'r Blood's train while this Springfield brake was on any of the cars of that train extend?

A. From that time until the brakes were taken off—the middle of August, I think.

Int. 3. Did you go away on a vacation about this time; if so, when did you go away?

A. About the 1st of August, 1872, and returned about the middle of August; I can't state exactly the day. I don't think I saw them on the train but once after I returned. The next time I looked—the next time I went up over the road—they were all off.

Int. 4. Then the substantial period over which these trips extended was from the last of April until the time you went away on your vacation—the first of August—was it?

A. Yes, sir.

Int. 5. During this period what days in the week did you ride on said Blood's train?

A. Seldom any day except Saturdays—and that up in the afternoon at 4 o'clock.

Int. 6. Did you ride on said train every Saturday afternoon during that time, and if not, state the facts about it?

A. Almost always, with the exception of afternoons when I went to the matinees at the theatre. Then I could not catch that train and had to go later—on the five or six o'clock train.

Int. 7. Did these later trains have any Springfield brakes on them?

A. They did not.

Int. 8. Now deducting the Saturday afternoons when you went to the matinees during said period, about how many Saturday afternoons would it leave during the period that you went on Blood's train, as near as you are able to recollect?

A. I should say not over eight or ten times. I went very frequently then to the theatre—more frequently than I had before or have since.

1401 Int. 9. During these eight or ten times, at how many of them did you see said Blood's train that had the Springfield brakes on, run by stations when attempting to stop?

A. I should say some five or six times; so much so that I noticed it.

Int. 10. You said in your deposition here on the 12th of October that you travelled on Blood's train, since last October, as often as from once to six times a week. Please state how many weeks during this period you travelled on said train as often as six times a week.

A. Only one week—in the spring of 1872.

Int. 11. Can you state what part of the spring of 1872 this week was?

A. The very last of March or the very first of April.

Int. 12. Before you knew that the Springfield brake was on any of the cars of said Blood's train, how much attention, if any, had you paid to the working of the brakes on said train?

A. Comparatively none.

Int. 13. When on said Blood's train during the time before you knew that the Springfield brakes were on any of the cars of that train, what were you usually doing while riding in the cars?

A. Almost always reading.

Int. 14. You spoke in your deposition here on October 12th, about Emerson's train being put on in the morning, and then Blood had no stops to make from Lowell until he got to East Woburn where he put on the first Hodge brake. Do you recollect about when it was that Emerson's train was put on?

A. The very last of May or first of June, 1872. I think it was the last of May.

Int 15. After Emerson's train was so put on, how many stops would it leave for Blood's train—with the Springfield brake cars alone on it—at which you could notice the operation of the brakes in stopping?

1402 A. None in the morning. On the four o'clock train in the afternoon he was liable to stop five times, but seldom stopped more than four.

Int. 16. You mean, do you, seldom more than four when he had only the Springfield brake to rely upon?

A. I do. Of the eleven stops which he was liable to make going up from Boston to Lowell at four o'clock in the afternoon, only four or five would be made with the Springfield brake alone; the rest would be made with the help of the Hodge brake.

Cross-examined by M'r Whipple:

Cr. 1. How many feet, according to your judgment, did the train with the Springfield brake on run by the stations?

A. I should not have noticed it to have made any minute of it, unless the train had made a bad run by. What I mean by a bad run by is almost the whole length of the four cars that constitute the train with the Springfield brakes on it.

Cr. 2. Did the train invariably run by at each station?

A. These five or six times that I have reference to the rear car stopped where the first car ought to have stopped and usually did stop with the Hodge brake on.

Cr. 3. Did you ever know a train to run by the length of it with the Hodge brake?

A. Never.

Cr. 4. Did you ever know it to run by the length of one car?

A. Yes, I have.

Cr. 5. The length of two cars?

A. Not if it was fully understood that the train was to stop there.

Cr. 6. Does not that train run at a high speed?

A. Very.

1403 Cr. 7. Is there any train on the road that runs at a higher speed?

A. None, unless they are late.

Cr. 8. What should you judge to be the speed which the train must run in order to make its time?

A. I should judge that M'r Blood's four o'clock train out of Boston—between the stations at which he is liable to stop between Winchester and Lowell—ran at the rate of thirty miles an hour.

Cr. 9. In running this train is it necessary that very slow time should be made out of the city of Boston and into the city of Lowell?

A. They make very slow time until they get to Winchester.

Cr. 10. What is the distance from Boston?

A. Eight miles.

Cr. 11. And what is the time for the last mile in going to Lowell?

A. I can't state exactly the time. The last mile is from the Bleachery in, and they run there, I should say, at the rate of 18 to 20 miles an hour.

Cr. 12. From the lower to the upper station do you think they run at the rate of 18 or 20 miles an hour?

A. I am only speaking about coming up to the Middlesex street depot. Between the Merrimack street and Middlesex street depots I never go.

Cr. 13. The hour and five minutes, or the hour and twelve minutes, in which the time-table requires the trip to be made, you understand includes the starting at Boston and arriving at the Merrimack street depot in Lowell?

A. Yes, sir; I so understand.

Cr. 14. What should you judge to be the time in the city of Lowell between the two depots?

A. I go there so seldom I cannot state with any accuracy.

Cr. 15. It is very slow, is it not?

1404 A. The engine is detached, I should say, more than half way between the depots and the cars run in of their own accord, because they have to cross a street. It is all a level street going in after the engine is detached, but they have to cross this street and they go down at a pretty slow rate.

Cr. 16. Then whatever time is lost in getting out of Boston and getting into Lowell, to the Merrimack street depot, must be deducted from the hour and five minutes or the hour and twelve minutes, which constitutes the time of the train, must it not?

A. Yes, sir; I should think it would leave them about an hour to run it.

Cr. 17. Then would not the train, in your judgment, have to make more than thirty miles an hour between the stations, and between the two cities, in order to make the time and make the stops?

A. Not that train; no, sir; I don't think it would.

Cr. 18. Supposing it had to make 13 stops between Boston and Lowell, would not a higher speed be required between some of the stations than thirty miles an hour?

A. I don't think the train ever runs over thirty miles an hour.

Cr. 19. Did you ever time the train so as to determine accurately the speed?

A. I have; yes, sir.

Cr. 20. In what way?

A. By the watch.

Cr. 21. In what method by the watch?

A. By minutes and seconds.

Cr. 22. Well, what data did you have other than the minutes and seconds; you must have had some data to go by?

A. Well, when we would start from a station, or when we would pass a station—for instance we always pass Wilmington—I have noticed that, taken my watch in hand, and seen how long we have been in going
from one station to another. This was brought about by a con-
1405 troversy which I had in relation to the speed of trains, having no
reference to this case whatever.

Cr. 23. Did you take into account the number of miles from one station to the other?

A. Yes, sir.

Cr. 24. And then the time in which the train was passing over that distance?

A. Yes, sir.

Cr. 25. And you came to the conclusion that the average speed of that train is thirty miles an hour?

A. Yes, sir; after leaving all the Hodge brakes off. They run faster then. The average speed would be about thirty miles an hour.

Cr. 26. What was the speed of the train when the cars having the Hodge brake on were in it?

A. It takes us twenty minutes to go eight miles.

Cr. 27. Well, what would be the number of miles per hour at that rate?

A. Three times twenty are sixty, and eight times three are twenty-four.

Cr. 28. Well, how many miles per hour is it, as you figure it?

A. I should say that, at the rate they run out, it is about twenty-four miles an hour, if I am anything of a mathematician.

W. R. BATCHELDER.

Deposition of A. G. Batchelder (recalled), taken at Boston, Oct. 23, 1872.

Direct examination by M'r Cozzens:

Int. 1. Have you any correction to make in the testimony you gave here Oct. 12, 1872, in reference to the name of the person by whose order the Batchelder and Thompson brake was taken off of the Lowell Railroad, as you stated the other day? If so, please make it.

1406 A. I stated the other day that it was by the order of Superintendent Winslow. But on reflection, M'r Godfrey King told me that he had orders (that is the correct statement of it) to put on M'r Hodge's brake, and he would have to take off the Batchelder and Thompson brake from that car in order to put on the Hodge brake.

Int. 2. Was, then, the Batchelder and Thompson brake running on the Lowell road until the Hodge brake was ordered to be put on?

A. It was running up to that time.

Int. 3. About what time was it that the Hodge brake was ordered to be put on?

A. I think it was about the time that M'r Hodge took out his patent. It was in the fall of the year; the first of November, I think it was.

Int. 4. Which year was this? The year that you first put the Batchelder and Thompson brake on the Lowell road, or some other year?

A. I put it on in 1848; and this was at the time that Hodge received his patent. I don't know the date of his patent. I can't tell whether it was the same year or the next year. All I can judge by is by Hodge's patent. I know that Hodge was round himself assisting to put it on, for he called to see me at that time and told me about his patent.

Int. 5. Then, do you mean that the Batchelder and Thompson brake continued on the Lowell road from the time you put it on, as you stated the other day—in the summer of 1848—until soon after Hodge's patent was obtained and the Hodge brake was ordered to be put on?

A. Yes; that is what I mean to state.

Int. 6. Have you reflected on this subject with reference to arriving at this length of time, since you made your second cross-answer on your examination here, Oct. 12, 1872?

1407 A. I have. I was thinking it over going up to Lowell that same day. The circumstance that it was on the car at the time that Hodge came round with his, led me to think that I might have been mistaken whether it was the same year or the next year.

Int. 7. You stated, in your deposition of Oct. 12, 1872, that when you applied the Batchelder and Thompson brake on the Fitchburg road, in October, 1847, and on the Boston and Lowell road in the summer of 1848, you placed the truck-levers inside the truck frames, back of the king-bolt; and placed them upright, so that the top of the lever would vibrate either way. Please state what, with this arrangement, would be about the line of draft from the centre-lever to the truck-levers when the brake was applied.

A. Well, it would be nearly on a line with the body of the car when it stood on a straight track.

Int. 8. In this arrangement, how would the line of draft be with reference to the king-bolts of the car when the brake was applied?

A. It would be in a direct line with the king-bolts.

Cross-examined by M'r Whipple:

Cr. 1. From your best judgment, how many months was the Batchelder and Thompson brake on a car of the Boston and Lowell road before it was superseded by the Hodge brake?

A. Well, it might have been six months, and might have been a year and six months; but my impression is now that it was one year, and from June to November of the next year.

Cr. 2. Did M'r Godfrey King, the master mechanic at that time on the Boston and Lowell Railroad, think enough of the operation of the Batchelder and Thompson brake, during the time it was on that car, to wish to put it on any other cars of that road?

A. I presume he did. From what he said to me, he thought considerable of it, but they had no authority to put it on any cars at all.

1408 Cr. 3. Who was superintendent of that road at that time?

A. I don't know. I can't say now. I presume I knew at the time, but I don't recollect now.

Cr. 4. In the case of Thomas Sayles vs. The Philadelphia, Wilmington and Baltimore Railroad Company, did not Godfrey King testify that you put a Batchelder and Thompson brake on a car of the Boston and Lowell road, with the large thrust-rods, such as are seen in the Patent Office model filed in the office in June, 1847?

A. I believe he did; but he did not testify correctly. He was mistaken; because I put it on with my own hands, and know how it was put on.

A. G. BATCHELDER.

Deposition of Benjamin F. George, taken at Boston, October 23, 1872.

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

A. My name is Benjamin F. George; my age is about forty; I reside at Nashua, New Hampshire; and my profession is that of a civil engineer.

Int. 2. About how many years have you been a civil engineer?

A. About twenty years.

Int. 3. Are you at the present time engaged as civil engineer on any railroad? If so, what railroad?

A. I am. I am engaged as principal assistant engineer of the Boston, Lowell and Nashua Railroad. In the absence of the chief engineer I act in his place.

Int. 4. How long have you been so engaged on that road?

1409 A. Going on six years.

Int. 5. Are you familiar with the degrees of curvature on the curves of said road? If so, please state the minimum degree of curvature of some of the curves on the Boston and Lowell road.

A. Yes, sir; I am. Not with all of them, however, but most of them. Such as I have had occasion to examine I have found to be in the vicinity of 2,865 feet radius, in the main line proper.

Int. 6. Can you mention the places where these curves are?

A. There is one at Somerville Centre, one at North Billerica, and one near the Woburn watering station. That is all that occur to me just at this moment.

Int. 7. Are these curves of 2,865 feet radius the sharpest curves on the main line between Boston and Lowell?

A. From East Cambridge to Boston we have a passenger track that is separate and distinct from the main line. On that there is a curve of one thousand feet radius, or 955 feet are the exact figures. With that exception those are the sharpest curves there are on the main line between Boston and Lowell. I know of none sharper.

Int. 8. Are you familiar with the radius of the curves which are usually formed when turn-outs are made from main tracks or elsewhere? If so, please state what is the usual or frequent radius of such curves.

A. Yes; I am somewhat familiar with them. In answer to the second part of the question I would say that our rule for the minimum radius is 500 feet from the mouth of the switch until we pass the rail on the main track.

Int. 9. Does this apply to turn-outs which run from the main line of the roads?

A. Yes; on our road.

Int. 10. You say the rule for the minimum radius is 500 feet.
1410 Please give us some idea how frequently curves on such turn-outs as inquired about are of 500 feet radius or in that vicinity.

A. I should say that more than half were 500 feet radius.

Int. 11. Will you please state how many feet are represented by one degree of curvature?

A. In round figures, 5,730 feet radius. That is not exact, however. The mathematical answer to that would be 5,729.69. We call it for practical purposes in our work 5,730 feet.

Int. 12. Then, if a curve is given you as a one-degree curve, does that mean a curve of 5,730 feet radius?

A. Yes, sir.

Int. 13. And if a curve be given you of two degrees or three degrees, how do you arrive at the number of feet of radius from those data?

A. Divide 5,730 by the degree of curvature.

Int. 14. That is, two or three in the case supposed?

A. Yes, sir.

Cross-examined by M'r Whipple:

Cr. 1. Are there any curves of 500 feet radius connecting the main tracks either in Boston or in Lowell over which passenger trains run?

A. Yes, sir.

Cr. 2. At what places?

A. At Lowell.

Cr. 3. Are there any in Boston?

A. There may be, but I do not think of any now.

BENJAMIN F. GEORGE.

1411 *Deposition of John McAlister, taken at Boston, October* 23, 1872.

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

A. My name is John McAlister; I am about 25 years of age; residence, Boston Highlands; I am a car builder by trade.

Int. 2. Are you at present employed on any railroad; and, if so, on what railroad?

A. I am; on the Boston and Lowell Railroad.

Int. 3. About how long have you been employed on that road?

A. Very near three years.

Int. 4. What have been your duties on that road during those three years?

A. Most of the time in the shop building cars, and when they wanted any extra help up at the car-house I was sent up there to inspect cars.

Int. 5. What are your duties at the present time?

A. I am inspecting at the present time because the man broke his toe, I believe, and he is off, and I am to stay there for a while. I don't know how long.

Int. 6. Have you had a good deal of experience in inspecting cars when they come in on trains?

A. Yes, sir; not on this road alone, but on other roads.

Int. 7. What sort of things do you have to do when you look over cars?

A. I have to sound the wheels and look over the brakes and see if there are any bolts broke or loose; and if there is any broke or loose I tighten it up or repair it if I can.

Int. 8. What do you have to do with the brakes?

A. Take them up sometimes. If there is a nut loose on the
1412 bottom of the rod I have to tighten it up a little. Sometimes a
shoe will be loose, and I have to tighten that up.

Int. 9. Do you remember a train of cars known as John C. Blood's train, or Conductor Blood's train, on the Boston and Lowell Railroad, which had in it four cars having on them what is called the Springfield brake?

A. Yes, sir.

Int. 10. Do you remember a certain trial week during which that train with those four Springfield brake cars in it was run on said road?

A. Yes, sir.

Int. 11. During that trial week, who inspected or looked over the cars in that train that had the Springfield brakes when they came into the car house at Cambridge at this end of the road?

A. I did.

Int. 12. Did you have to adjust the Springfield brakes on those four cars during that trial week; and, if so, how often?

A. Every time they came in; that is, every time they came over into the car house. Of course, when they came into the depot I was not there to look after them.

Int. 13. You mean the car house at Cambridge?

A. Yes, sir.

Int. 14. During that trial week, how often did they come into that car house at Cambridge?

A. I don't think they came in there but once a day, and that in the morning.

Int. 15. How often do you say you adjusted them?

A. Once a day.

Int. 16. When they so came in in the morning?

A. Yes, sir.

Int. 17. About how much time did you sometimes have to spend during this trial week adjusting these Springfield brakes?

A. Well, if I knew how long that train was in I could tell.
1413 For some days—almost every day during that week—I was out
there from the time they came in until they went out.

Int. 18. You were at work adjusting all the time?

A. Yes, sir.

Int. 19. Can you give us some idea how long that would be sometimes?

A. About one hour and a half.

Int. 20. Did you have anybody helping you adjust these Springfield brakes during this time?

A. Yes, sir.

Int. 21. Did you when, as you have stated, you were adjusting those brakes all the time from the time the train came in until it went out, always get the adjustment finished?

A. No, sir.

Int. 22. At any of these times when you say you failed to complete the adjustment in time for the train to go out, did you have anybody helping you during part of the time?

A. Yes, sir.

Int. 23. You say you have been employed upon other roads—about how long have you been engaged in railroading?

A. About fifteen years.

Int. 24. What have been your duties in railroading during that time?

A. I have been firing. I have been engineering and car-building. I didn't go a great deal engineering, because I only ran a gravel train a little while. I was firing a few years.

Int. 25. Are you a practical car-builder?

A. Yes, sir.

Int. 26. Practically familiar with the business?

A. Yes, sir.

Int. 27. From what you saw of these Springfield brakes during the time they were on the Boston and Lowell Railroad, what is your opinion of them as a brake to be used on a railroad?

A. I think they are a very poor thing.

1414 Int. 28. Do you know about how many cars there are belonging to the Boston and Lowell Railroad that use the double brakes?

A. I know how many passenger cars we have got, I think, but I don't know the exact number of cars we have got on the railroad.

Int. 29. State the number as nearly as you can.

A. I think we have got 67 passenger cars. How many smoking cars and baggage cars there are I can't say. That is, running with passenger trains. I do not mean the freight trains.

Int. 30. Now suppose that all the cars belonging to the Boston and Lowell Railroad which run on passenger trains were equipped with the Springfield brake, how many men do you think it would take to adjust those brakes properly?

A. I should think it would take about fifteen or twenty.

Int. 31. How many men are there now employed on the Boston and Lowell Railroad inspecting and looking after the cars and adjusting the brakes?

A. We have only got three men, I believe, in the car house to look after the whole of the cars and adjust the brakes. Well, there is no adjusting at all to amount to anything. The most that we have to look after now is to look and see if there is anything broke on the train—to see if the wheels are not broke, or anything loose—and so on. They don't have to touch one of these other brakes once in a dog's age, without it is to put on a brake-shoe. If the brake-shoe is worn down a little, then we may have to take up a little of the slack.

Int. 32. What brake do you refer to when you say "these other brakes"?

A. The Hodge brake.

Int. 33. How often do you say you have to adjust the Hodge brake?

1415 A. We don't have to touch them any oftener than a shoe is worn down, and perhaps that won't be more than once in three months.

Int. 34. You say that three men do the whole duty of looking over the cars—inspecting them, and adjusting the brakes—on the Lowell road at the present time?

A. Yes, sir; and put in the wheels too.

Int. 35. What are the wages of yourself and the men who have this duty of inspecting and looking after the cars and adjusting the brakes?

A. I am getting $2.75 a day, and I think some of the other men are getting $2.50.

Int. 36. While these Springfield brakes were on this train of M'r Blood's, did you see any of the brakemen who ran on that train?

A. Yes, sir; I used to see both of them every morning.

Int. 37. Did you ever hear any complaints from these brakemen as to how the Springfield brakes worked on that train?

A. Yes, sir.

Int. 38. About how frequently did they complain?

A. Almost every morning when they came in unless it was during the trial trips, when they did not seem to find so much fault, because I kept them up as well as I could.

Int. 39. What do you mean by keeping them up?

A. Keeping the brakes adjusted as well as I could.

Int. 40. Are there any cars that run over the Boston and Lowell road which run beyond Lowell or Nashua?

A. Oh, yes; we have a number of cars that run up to Concord and way up to Montreal—Vermont Central cars. Then we have cars that run up to Winnipisseogee, and Plymouth, and Littleton.

Int. 41. Do you know about how many cars run through to Montreal?

A. Yes; I think there are four. I don't know exactly how
1416 many run through to Montreal. There are two Vermont Cen-
trals and two Pullman cars. I don't know whether they all run
to Montreal or not.

Int. 42. How many do you know of that run to Montreal?

A. I think there are only the two Pullman cars.

Int. 43. Are these Pullman cars sleeping cars?

A. Yes, sir; both of them are sleeping cars.

Int. 44. In your opinion, as a railroad man, how would the Springfield brake answer for cars that have to run as far as these sleeping cars do—namely, from Boston to Montreal?

A. I don't think they would answer very well.

Int. 45. Why not?

A. Because, by the time they had run up there and back again, they would have got pretty well shaken to pieces. I should not think there would be much of them left, the way those worked.

Int. 46. To what do you refer when you say "the way those worked"?

A. The Springfield brake that was on Blood's train—for sometimes when they got in the bolts on the connecting rod from one brake to another would be worked loose and be half-way out—almost all of them, sometimes.

Int. 47. Did you ever have any difficulty with these Springfield brakes on Blood's train in adjusting them so that they would operate equally?

A. Yes, sir; I couldn't do it.

Int. 48. Why couldn't you do it?

A. Well, that is something I couldn't see into hardly—why I couldn't do it. When I would tighten up one of the rods that run through the brake-beam to bring the shoe up to the wheel, in drawing up one I would perhaps draw up the other one too tight, and the other would not be tight enough, and that is the reason why I couldn't adjust them properly. Say one brake hung off from the wheels two inches and the other
half an inch, or an inch—when I tried to bring up the one farthest
1417 off as near up as the other one was, I would bring the one that
was nighest close up, and the other one would not be up close
enough.

Int. 49. How often did you have such a difficulty as this?

A. Well, as often as I had a mind to go to work at it to do it.

Int. 50. While this Springfield brake was on these cars, did you have occasion to put any new brake-beams into the cars?

A. No, sir; it would not break a brake-beam.

JOHN McALISTER.

Deposition of Julius P. Searle, taken at New Haven, Oct. 14, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. Julius P. Searle; 56; New Haven, Conn.; baggage master in depot at New Haven.

Q. 2. How long have you been engaged in railroading?

A. Twenty years and one-half.

Q. 3. In what capacities?

A. Most of the time stationed in New Haven; occasionally was in the habit—from 1853 to 1860—of running from Boston to New York in the baggage car, taking the place of regular baggage-master.

Q. 4. Do you recollect of a brake being put on the New York line cars about fifteen years ago called the Springfield brake?

A. Yes; about 1856 or 1857.

Q. 5. How did that Springfield brake work?

A. The brake didn't give very good satisfaction—wasn't considered reliable.

Q. 6. Was it, or not, considered a safe brake by the men on the train?

1418 A. It was not considered very safe. It caused considerable trouble to brakemen in bringing the cars to a stop.

Q. 7. About how long was this Springfield brake used on said line cars?

A. I should think about a year.

Q. 8. Did you run as baggage-master on the train some considerable time—while those brakes were in use—between New York and Boston?

A. I made several trips on the road while these brakes were in use, from New York to Boston.

Q. 9. Did you, or not, often run by stations when those brakes were used?

A. Could not say as to running by stations, but found difficulty as to bringing cars to a stop coming into depots with that brake.

Q. 10. Did you have occasion to switch cars with brakes on at depots?

A. No, sir; I had nothing to do with switching them.

Q. 11. What do you mean by finding "difficulty as to running into depots" with that brake?

A. Particularly the Springfield depot. Were in the habit of cutting the baggage car off above the crossing from the train, and let it run down to where the baggage car should stop. Used to run by sometimes, and had to back up, stopping the passenger cars above; also in going into the yard in New York; because the brake didn't always hold; couldn't rely upon it. Caused considerable trouble to employés; and a good deal was said about it by men on the train that operated the brakes.

Cross-examined by M'r Whipple:

Cr. 1. How many different engineers hauled the trains on the express line at that time?

1419 A. Four. One from Boston to Worcester, Worcester to Springfield, Springfield to New Haven, New Haven to New York.

Cr. 2. As a general rule, did the train come in on time at Worcester, Springfield, New Haven, and New York, when the Springfield brake was in use on said train?

A. Couldn't say; don't remember.

Cr. 3. Can you say that they did not come in on time?

A. I couldn't say that they did not come in on time from that cause; not positively.

Cr. 4. Do you think that, as a general rule, the trains arrived at these points on time?

A. I think occasionally, from that brake, the trains were in the habit of running by stations and backing up, so using up time. I don't think anything about it. I don't know, because it isn't clear to me; it's a long time ago. I know that we had a good deal of trouble with the brake.

Cr. 5. Is it clear to you that you had trouble with the brake?

A. Yes, sir.

Cr. 6. But it isn't clear to you that that train was run on time? Is that so?

A. I say a train might have run past a station by a bad brake and lost time, and still arrive at a station on time by making up the time.

Cr. 7. Did the train, as a general rule, arrive at stations on time?

A. I couldn't say.

Cr. 8. Do you think the officers of the New York and New Haven road, Springfield and Hartford, the Western road, and the Boston and Worcester Railroad, would run a train for more than a year on a fast express line with a brake thereon that was unreliable and unsafe?

A. I don't know.

Cr. 9. How long did they run this brake that you say is unreliable and unsafe?

1420 A. I think about one year is my answer.

Cr. 10. Do you think the officers of a railroad feel the responsibility of running a train safely, as much so as the employees of the road?

A. One brake to a car might stop a train when another would not work. There are other brakes as well as that which might be out of order. Sometimes a brake catches and throws men off. I think the officers do feel the responsibility.

Cr. 11. And yet you think they would run a train with brakes thereon which were unreliable and unsafe, do you?

A. I think they would not run a train with a brake that they considered unsafe.

Cr. 12. Did they run a train the brakes of which were said to be unsafe?

A. They ran a train with brakes said to be so by the employees. I don't know as the officers considered them unsafe.

JULIUS P. SEARLE.

Deposition of E. Upson, taken at New Haven, Oct. 14, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. E. Upson; 41; New Haven; baggage-master in depot at New Haven.

Q. 2. Were you ever brakeman on the New York and Boston line cars; if so, when and how long?

A. I was, about 15 years ago, for about two years.

Q. 3. What brakes were used on the Boston line cars while you were brakeman?

A. The Springfield brake.

Q. 4. About how long were those Springfield brakes used as near as you can remember?

1421 A. I couldn't tell exactly how long. I think one year. Might have been longer.

Q. 5. How did those Springfield brakes work?

A. Did not work very well.

Q. 6. What seemed to be the difficulty with them?

A. They didn't seem to have any power. Didn't seem to hold the train.

Q. 7. Did you consider them a safe brake?

A. I did not.

Q. 8. Did you or not feel safe on the train while those Springfield brakes were in use, or were you in fear?

A. I did not think they were safe, nor feel as though it was safe to ride on the train with those brakes.

Q. 9. Were you able to make good stops while those brakes were used?

A. Did not make very good stops; used to run by.

Q. 10. What brake was put on after they were taken off?

A. Hodge's brake, and I think it has been continued ever since.

Q. 11. Were you or not able to make goods stops with the Hodge brake, and did you feel safe on the train?

A. I considered them a good brake. Made very good stops, and considered them safe.

Cross-examined by M'r Whipple:

Cr. 1. Did you make good time with the Hodge brake?

A. We did.

Cr. 2. Did you make the same time with the Springfield brake between the two points, that is, Springfield and New Haven; and with this I mean to say did you arrive in Springfield and also New Haven on time?

1422 A. Used to have to run faster to make time. Were hindered a good deal by running by and backing up with the Springfield brake. Generally—sometimes were five or ten minutes late.

Cr. 3. Were you ever five or ten minutes late with the Hodge brake?

A. Might have been, sometimes. Generally made time with it.

Cr. 4. Did you generally make time with the Springfield brake?

A. We could not.

Cr. 5. Did you as a general rule arrive at New Haven on time with the Springfield brake?

A. Generally somewhat late.

Cr. 6. How much late?

A. From five to ten minutes.

Cr. 7. Was this always due to the brakes?

A. Not always. Sometimes had a hot box, or were hindered about getting baggage in; but as a general thing were hindered by the brakes.

Cr. 8. May not there have been other causes to delay a train besides hot boxes and taking in baggage? If so, state them.

A. There were various causes. Sometimes by waiting for trains; sometimes by heavy trains; might be by obstructions on the track.

Cr. 9. When all things were favorable did you you arrive at Springfield and New Haven on time as a general rule?

A. I think not.

Cr. 10. How many times in a week, should you judge, did you arrive in Springfield and New Haven behind time in consequence of the brakes?

A. Most every day.

Cr. 11. Are you quite sure that such is the fact?

A. I think I am.

Cr. 12. Do you feel perfectly safe on trains with the Hodge brake?

A. I do.

1423 Cr. 13. Is the Hodge brake a perfect immunity against accidents?

A. I think it is.

Cr. 14. Did you ever know of an accident to a train on the New Haven road the cars of which were equipped with the Hodge brake?

A. Accidents might have happened by running off the track or something of that sort; couldn't state every particular in regard to it.

Cr. 15. Do you consider trains equipped with the Westinghouse air brake, now in use on the New York and New Haven road, any more safe than when the same trains were stopped by man power and the hand brake?

A. I haven't been on the train since the air brakes have been put on.

Cr. 16. Do you think the officers of the New Haven, Hartford and Springfield road would run the express line of cars with the Springfield brake thereon if it was unsafe, as your testimony would seem to indicate?

A. I do not, if they found a better one.

Cr. 17. What better brake did they find?

A. Hodge's.

Cr. 18. What brake did they use on this line before they put the Springfield brake on?

A. Couldn't say.

Cr. 19. Have they ever used any other double brakes on the cars of the New Haven, Hartford and Springfield road besides the Hodge brake?

A. I couldn't state that.

Cr. 20. In running the express line of cars from Springfield to New Haven, did they run any other cars than the express line cars when the Springfield brake was on said cars?

A. I think not.

Cr. 21. Was it customary to run any New Haven cars on said express line from New Haven to Springfield, or any other cars than express line cars?

1424 A. They might sometimes.

Cr. 22. If they did so run such cars, for what purpose were they run?

A. To carry passengers.

Redirect by M'r Sayles:

Q. 12. Might they not have run some of the New Haven, Hartford and Springfield cars occasionally on the express trains from Springfield to New Haven when the Springfield brake was used?

A. They might.

Recross by M'r Whipple:

Cr. 23. For what purpose were these cars run if at all occasionally on said express line?

A. To have room, I suppose, for passengers.

Cr. 24. Do you know of their being put on for any other purpose than to convey passengers?

A. I do not know any other reason.

ERASTUS UPSON.

Deposition of L. F. Crane, taken at New Haven, Oct. 14, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. L. F. Crane; 47; New Haven; tallyman for steamboat company.

Q. 2. Have you ever been employed on railroads; if so, in what capacity, and when were you so employed?

A. I have been employed on railroads as brakeman, baggage master, and conductor on the New Haven, Hartford and Springfield Railroad, between 1857 and 1865.

1425 Q. 3. Were you a brakeman on said railroad in 1857; if so, on what trains?

A. On the day express in 1857.

Q. 4. Do you remember a brake being used on the New York and Boston express-train about that time called the Springfield brake?

A. I do.

Q. 5. Did you use that brake?

A. I did.

Q. 6. About how long was that brake used on those express-trains?

A. I should say it was a year or more.

Q. 7. From what point to what point did you run on those trains at that time?

A. I ran from New Haven to Springfield, and back.

Q. 8. How did those Springfield brakes work?

A. They didn't work to suit me.

Q. 9. What seemed to be the trouble with them?

A. The brake wouldn't hold the car.

Q. 10. Were you able with those Springfield brakes to stop the train properly at stations?

A. Not at all times.

Q. 11. Did you consider them a safe brake for stopping trains?

A. I did not if all the brakes were that same kind on the same train.

Q. 12. How did those Springfield brakes operate in switching cars in making up trains; could you hold the cars with them?

A. Could not.

Q. 13. What kind of brakes were used on the cars belonging to the New Haven, Hartford and Springfield Railroad at the time these Springfield brakes were being used on the line cars, and before and since?

A. The brake used at that time was a lever across under the centre of the car.

1426 Q. 14. Were any of those cars ever attached to the express-trains at Springfield and run through to New Haven?

A. They were.

Q. 15. Did you often brake upon them?

A. I did.

Q. 16. How did they answer the purpose of stopping the train at stations, compared with the Springfield brakes?

A. The brakes on cars that belonged to the Hartford and Springfield road worked well.

Q. 17. Did you brake on the local trains between New Haven and Springfield while those centre lever brakes were on the cars; and, if so, how did they work?

A. I did, about one year and one half—might have been more than that. The brakes on the local cars worked well.

Q. 18. Did you consider the Springfield brake a safe brake, and did you feel safe on the trains while they were used?

A. I did not consider it a safe brake. I did not.

Cross-examination by M'r Whipple:

Cr. 1. Did you ever brake on a train on which the Hodge brake was used, the same as are now in use on the cars of the Hartford and Springfield road?

A. I have.

Cr. 2. Of the three brakes, Springfield brake, centre lever brake, and Hodge brake, which do you prefer?

A. I should prefer the Hodge brake.

Cr. 3. What reason can you give for such preference?

A. The reason is this. The brake that I was using at that time I took to be the Hodge brake, although I didn't examine nor know what the name of it was, although I knew it was a good brake.

1427 Cr. 4. May not the Hodge brake, the centre lever brake, and the Springfield brake, be all good brakes if properly applied, mechanically, and adjusted, and the wear of the shoes taken up?

A. The Hodge brake, and the Hartford and Springfield brake are a good brake. But the Springfield brake I don't consider good.

Cr. 5. Are you sufficiently acquainted with the construction and application of brakes to cars to say that the Springfield brake cannot be so constructed and adjusted as to hold a car as well as the Hartford and Springfield brake?

A. I do.

Cr. 6. You will please describe the construction and operation of the Springfield brake, and state wherein it is not capable of holding the car as well as the Hartford and Springfield brake?

A. The Hartford and Springfield brake would hold the car, and the Springfield would not; I could depend on that when I couldn't on the other.

Cr. 7. What was there defective in the construction of the Springfield brake that would not hold as well as the Hartford and Springfield brake?

A. The reason is this. When I applied the brake I knew as soon as I wanted to get a car to a certain point that I was on that brake (the Springfield) because it wouldn't hold. It wouldn't hold the car.

Cr. 8. May not the Springfield brake be so constructed and applied to a car as to hold it as a car ought to be held by the brakes?

A. I never saw it.

Cr. 9. Did the train with said Springfield brake on usually make time between New Haven and Springfield and return?

A. I never had anything to do in regard to the time at all.

Cr. 10. Did not you as a brakeman know whether a train made its time or not?

A. Sometimes the train was late from causes I didn't know—south and north.

1428 Cr. 11. How frequently was it late in which you could properly attribute it to the brakes?

A. At one time at Springfield we had to switch out a car and put it into the car-house; at this time, in switching this car—in running into the car house—supposing I could hold it at the same distance I usually did other cars, I applied the brake as I would any other car with a proper brake, and I run against the side of the building and the bunter went through the brick wall. The switching of this car made it late.

Cr. 12. Is that the only instance in which a late arrival of the train can be attributable to the brake?

A. None that I remember of. I don't remember of any time that the train was late in consequence of the brakes.

Redirect:

Q. 19. Did you not add to the answer to the last cross-question that you would sometimes run by stations and have to back up, and then run fast to make up time?

A. I did.

L. F. CANE.

Deposition of Edward Reynolds, taken at New Haven, October 14, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. Edward Reynolds; age, 47; residence, Springfield, Mass.; occupation, baggage-master New York, New Haven and Hartford Railroad.

Q. 2. Were you ever brakeman on the New York and Boston express trains?

A. I was.

Q. 3. Were you brakeman on said trains in 1857 or 1858?

A. Yes.

1429 Q. 4. Do you remember of a brake called the Springfield brake being used on said New York and Boston line of cars about 1857 or 1858?

A. Yes.

Q. 5. How did they work? Answer fully.

A. They didn't work, as you may say. Furthermore, they were not a safe brake to use, as we found out since. That's pretty plain too.

Q. 6. Were you, or not, able to stop trains at stations as a general rule, or did you run by often?

A. Couldn't depend upon them at all.

Q. 7. Did you, or not, feel safe on the train while those brakes were in use?

A. I couldn't say that I did.

Q. 8. In what capacity were you acting on the train when those Springfield brakes were used, and from what points did you run?

A. From New Haven to Springfield, as brakeman.

Cross-examination by S. M. Whipple:

Cr. 1. In answer to fifth direct question you say that the Springfield brakes were not a safe brake to use, "as we found out since." What do you mean by the words "as we found out since"?

A. As far as this, they were not a brake you could depend upon. The cars were liable to come together any moment.

Cr. 2. Question repeated. What do you mean by the words "as we found out since"?

A. That we had better brakes since the time they had them on.

Cr. 3. What brakes have you had since you had those on?

A. I can't say what the name is; for I pay no attention to the names of the brakes.

Cr. 4. Is that the way you found out that the Springfield brake was not a good brake, by the company's putting on afterwards a better brake?

1430 A. It was.

Cr. 5. How long did the company use this Springfield brake, and in what years did they use it?

A. I should think about two years or so, as near as I can recollect. About 1857.

Cr. 6. Is this New York express line, on which these brakes were used, a fast train?

A. It was the fastest train on the road.

Cr. 7. Did the engineer make his time with these brakes from one end of the road to the other?

A. Not at all times.

Cr. 8. How often did he fail?

A. Well, I can't say; but very often.

Cr. 9. Was his failure to make time always attributable to the brakes on the train?

A. That was the fault claimed by the engineer; most generally he complained that it was the bad braking.

EDWARD REYNOLDS.

Deposition of John D. Sherwood, taken at New Haven, Oct. 14, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. Name, John D. Sherwood; 38 years; New Haven; hotel keeper.

Q. 2. Were you ever brakeman on a railroad; if so, what road?

A. On the Harlem and New York and New Haven.

Q. 3. What trains were you brakeman on on the New York and New Haven road?

A. On nearly all the trains.

Q. 4. Were you or not brakeman on the New York and Boston express trains about 1858?

A. About that time I was.

1431 Q. 5. Do you remember, while you were braking on that train, of a brake being used on cars of that train, called the Springfield brake?

A. I do from reputation, and we used to curse it.

Q. 6. How did that Springfield brake work? Please answer fully.

A. As far as I had any connection with them, they were a very poor brake. It was very hard work to stop a train with them; required a good deal of manual labor. We had not the purchase, and they were not as elastic as the brakes used on the New York and New Haven road; would not hold a train near as well as the brakes on that road; did not consider those cars that those brakes were attached to as safe cars to get between to couple—that is, in all cases—that is, at all times. Sometimes the brakes were better than at other times.

Q. 7. Could you not rely upon them to stop the trains at stations, as a general thing?

A. As a general thing we stopped the trains at stations where we were ordered to stop. At times we would run by. We will, with most any brake, do that. Only difference was, if we had a poor brake, we would brake quicker than with a good brake. I mean by that, we would commence to brake quicker.

Q. 8. Was this Springfield brake considered a safe brake by the men on the train that you were on?

A. I can't answer for the men. To the best of my knowledge, young as I was in the business, I didn't know the difference—that is, as far as safety.

Q. 9. About how much quicker could you stop a train with the brakes that were on the New York and New Haven cars, than with the Springfield brakes on the line cars?

A. I am undecided about that. Shouldn't wish to answer anything I don't know about.

Cross-examination by M'r Whipple:

1432 Cr. 1. Between what points did you run as brakeman on the New York and Boston express line when the cars of said line had the Springfield brake on?

A. From New to New Haven, and return, each day; what is called the day express.

Cr. 2. Is that train the fastest train that runs over the New York and New Haven road?

A. I think at that time the night and day expresses were considered the fastest trains.

Cr. 3. What was the time between New York and New Haven?

A. I could not tell; should think about three hours.

Cr. 4. Whatever the time was between the two points named in your previous answer, did you make it?—that is to say, did you arrive at New Haven on time when said Springfield brakes were in use on the cars of said express line?

A. As a general thing, we did.

Cr. 5. Did you also make your time from New Haven to New York?

A. As a general thing, when the eastern trains were on time.

Cr. 6. Did you run as brakeman on said express line before and after the Springfield brakes were used on said line?

A. Never but one kind of brake while I ran on said train—to my knowledge.

Cr. 7. Do you know that that kind of brake was the Springfield brake?

A. Only as I heard it called so. Not to my personal knowledge.

JOHN D. SHERWOOD.

1433 *Deposition of John T. Dade, taken at New Haven, Oct.* 14, 1872.

Direct examination by M'r Sayles in person:

Q. 1. What is your name, age, residence, and occupation?

A. John T. Dade; 43; New Haven; U. S. mail carrier.

Q. 2. Have you ever been engaged on a railroad; if so, when and in what capacity, and on what road?

A. I have; on New York and New Haven Road; about sixteen years; in various capacities.

Q. 3. Were you brakeman on the New York and Boston line cars about fifteen years ago?

A. I wasn't a regular brakeman on them—I was running more or less at times when they required an extra man.

Q. 4. Do you remember a brake being used on those line cars about that time called the Springfield brake?

A. I do.

Q. 5. Did you use that Springfield brake when it was on said line cars; if so, how did it work?

A. I did. It worked very unsatisfactory. Didn't consider it a safe brake. Almost impossible sometimes to hold a car by itself while the car was in motion. As a general thing—when making up trains—when cars with those brakes on came along we would generally sing out to one another, "Here comes an old Springfield brake. Look out for it."

Q. 6. Was it or not difficult to hold a single car by itself and keep it from running against other cars harder than it should—when making up trains?

A. Yes, it was; you could place no dependence on the brake.

1434 Q. 7. Did you or not often run by stations when using these Springfield brakes?

A. Yes, we did.

Cross-examined by M'r Whipple:

Cr. 1. When did you first hear this brake called the "Springfield brake"?

A. About the time it first came on the road; fourteen or fifteen years ago. I couldn't state any particular time.

Cr. 2. May it not be possible that you never heard the term "Springfield brake" until M'r Sayles told you the name it was called by?

A. No.

Cr. 3. Did the trains arrive as a general rule at stations on time when this brake was on?

A. That I couldn't say. We might lost time in running by a station and made it up. In those days we used to run at pretty big speed to make up the time.

Cr. 4. Does that train, as a general rule, now arrive at stations on time?

A. Well, this summer and this fall they haven't—run very heavy trains—double the amount of cars on trains that they used to run in those days.

Cr. 5. Did you run on that train after the Springfield brake was taken off; if so, did it arrive at stations as a general rule on time?

A. I did. As a general rule it did. We stopped the trains easier—could place more dependence on the brakes. Could stop at stations and at water-tanks with more dependence on the brake. As a general thing—with good brakes—could stop almost within three feet.

Cr. 6. Could you stop at stations and water-tanks with the Springfield brake?

A. We might one time out of ten—but chances are we would go a train's length by them.

1435 Cr. 7. Then as a general rule you wish to be understood, do you, that you brakemen were obliged to let the train run the length of it by a station, while with another brake you could stop within three feet of where you wished to?

A. I do.

Cr. 8. How many lengths of train does it require ordinarily to stop a train, at ordinary speed on level grade, at about twenty-five miles an hour?

A. About two hundred and fifty feet.

Cr. 9. How many feet do think it required to stop a train with the Springfield brake?

A. I think in cases I see them work sometimes, it would be almost impossible to stop them anyway.

Cr. 10. A train would stop, I presume, if it hadn't any brakes, sometimes.

A. I suppose if it struck an up grade, and the engineer might stop it by reversing his engine.

Cr. 11. You will please now state how many feet in your judgment it would require to stop a train, say of six cars, three brakemen; the train running at a speed of twenty-five miles an hour, level grade and no reversing of the engine, with the Springfield brake on the cars?

A. I should think, in the best of my judgment, from five hundred to seven hundred feet.

Cr. 12. Do you think, as a general rule, the train was stopped with the Springfield brake within from seven hundred to one thousand feet?

A. I do not.

Cr. 13. What number of feet would you like to add to seven hundred feet?

A. The possibility was that they might be stopped, and then again there was no dependence to be placed as to what you could stop them at.

Cr. 14 Stopped at what?

A. They might run 1,200 feet.

Cr. 15. How often did they exceed 1,200 feet in your judgment?

1436 A. Couldn't say.

Cr. 16. Did the stopping of the train sometimes fall short of 1,200 feet as well as run above?

A. I never knew them to stop short of station. You couldn't stop the train with those brakes within the same distance of those brakes they are using now; not by one half. I mean the Hodge hand-brake.

Cr. 17. You said those brakes they are using would stop a train in 200 to 300 feet; how many more feet would you wish to add to that?

A. I would say in 3 train lengths, now, if the brakes were in good order; couldn't say about the feet.

Cr. 18. How many train lengths do you think it would require to stop the train with Springfield brakes on level grade; speed 25 miles an hour?

A. I should think to the best of my judgment it would take double the length it would to stop with the other ones.

Cr. 19. You say in making up trains you used to call out to the brakemen: "Look out for the Springfield brake;" what other cars and other brakes were used to make up this train called the express line?

A. We used our own local cars; the New York and New Haven road. Generally left those cars at Stamford; sometimes brought them to New Haven.

Cr. 20. For what purpose were these local cars put into this express line?

A. At times when they had a rush of travel to Stamford to carry passengers; sometimes to use on morning trains.

Redirect by M'r Sayles:

Q. 8. In your cross-examination you have spoken of stopping trains at a certain number of feet. Had you any idea of the number of 1437 feet it required to stop a train at the time you made those answers; and you afterwards stated number of lengths of trains. How do you wish to be understood?

A. I had no definite idea of the number of feet it required. Would be understood that we calculate to stop a train within about three lengths of an ordinary train.

JOHN P. DADE.

1438 Depositions of George Churchill and W'm Geddes, both of Greenbush, New York, taken before me, Amasa J. Parker, j'r, a United States commissioner in and for the northern district of New York, at the city of Albany, in the State of New York, on the 16th day of October, A. D. 1872, to be used on a final accounting before the master. Present, complainant in person, and S. M. Whipple for defendant.

Direct examination by M'r Sayles in person:

Q. 1. What is your name, age, residence, and occupation?

A. Name is George Churchill; age, 22 years; residence, Greenbush, New York; and occupation a fireman on the Boston and Albany Railroad.

Q. 2. How long have you been a fireman on said railroad?

A. I have been there about four years.

Q. 3. What train were you fireman on previous to July last?

A. J. B. Adams' train. William Geddes was engineer.

Q. 4. How long were you fireman on that train?

A. About six months.

Q. 5. During the time you were fireman on Adams' train did you notice any difference in the stopping of the trains at the stations; if so, what was the difference?

A. I noticed every other day that the trains did not stop so well at the stations as they did every alternate day.

Q. 6. Please state, if you know, the cause of their not stopping one day as they did another.

A. I asked M'r Taylor, the brakeman on the train, what the cause
was. He said he had the double chain-brakes, or the Springfield
1439 brakes, every other day, and he could not hold the train so well
as when he had the Hodge brake.

(Answer objected to as hearsay.)

Q. 7. How was the train stopped the days when they had those Springfield brakes on the train?

A. They were dragged into the stations. What I mean is, they applied the brakes so far back from the station. It took so long to stop that we could not make up the time between stations.

Q. 8. While those Springfield brakes were on the train that you were fireman on, what, if anything, did the engineer do to assist in stopping the train at the stations?

A. He would reverse his engine.

Q. 9. About how often did the engineer reverse his engine to stop the train?

A. About half the time. At about every other station.

Q. 10. Between what points did you run on that train?

A. Between Pittsfield and Albany; every other day.

Q. 11. While running the train, alternate days, which had on the Hodge brake, did you have any trouble in stopping at stations?

A. We did not.

Q. 12. Did M'r Geddes have to assist in stopping the train, by reversing his engine, when the Hodge brake was used?

A. I think not.

Cross-examined by S. M. Whipple:

Cr. 1. Are you still in the employ of the Boston and Albany Railroad Company as fireman?

A. I am.

Cr. 2. On what train do you now run, and who is engineer?

1440 A. I fire for W'm Geddes. I have no regular train now. My
engine has been in the shop for repairs.

Cr. 3. How are you employed at the present time?

A. I am employed as a fireman on a freight train run by W'm Geddes.

Cr. 4. At what time did you leave firing for W'm Geddes on M'r Adams' train?

A. The 4th of July last.

GEO. CHURCHILL.

Deposition of William Geddes, above named.

Direct examination by M'r Sayles in person:

Q. 1. What is your name, age, residence, and occupation?

A. W'm Geddes; about 35 years; Greenbush; and a locomotive-engineer.

Q. 2. How long have you been a locomotive-engineer on the Boston and Albany Railroad?

A. Ten years. This railroad was formerly known as the "Western Railroad Corporation."

Q. 3. What train did you run previous to 4th of July last, and how long did you run it?

A. John B. Adams' train I ran previous to 4th of July last for about six months.

Q. 4. What kind of brakes were used on M'r Adams' train?

A. One day we ran the Hodge brakes and the next day we used the Springfield brakes, as I was informed.

Q. 5. About when did the Springfield brakes appear on the train, as you were informed?

1441 A. I cannot say as to that. I found, about a month or so after I had been on this train, that they claimed there was a difference every other day about the brakes. All I know is through M'r Taylor, the brakeman. At some of the stations they missed holding the train as they ought to hold.

Q. 6. Did they, or did they not, often run by the stations when those Springfield brakes were on the train?

A. There were times when they could not hold the trains at the stations as they ought, and I could not say which the brakes were—only from what M'r Taylor said. M'r Taylor said it was the Springfield brake that would not hold the train at these times.

Q. 7. Did or not the brakemen apply the Springfield brakes, as they call them, so far back from the stations and drag the train into the stations so far that you found fault with the brakeman for so doing?

A. They claimed that they commenced to hold the train back far enough, and I asked them why they did so, and the brakemen told me they could not depend upon the brake unless they commenced so far back. They also said they were short-handed sometimes. They had but two brakemen on that train.

Q. 8. What, if anything, did you do to assist in stopping the train at stations, every other day, when they said they had the Springfield brake?

A. I applied the tender brake at times, and then again I reversed the engine to assist them, but I cannot say which day it was I assisted them. I assisted them when I saw they were running past the stations.

Q. 9. Was it the days they said they had the poor brakes that you assisted them in the manner aforesaid?

A. I cannot say that. I may not have spoken to them on all those days.

Q. 10. Who was your fireman while you ran Adams' train?

A. George Churchill—the man who has just testified in this case.

Q. 11. Did you hear his testimony this evening?

1442 A. Yes, a good portion of it. I did not pay particular attention to all of it.

Q. 12. Did you or not hear the brakemen on Adams' train often complain of the Springfield brakes working very badly?

A. I have often heard them speak of bad brakes. They called them the Springfield brakes, and said they could not hold with them. Sometimes I thought the brake might be out of order, and sometimes I thought the brakemen might be to blame.

Q. 13. Did you ever hear them complain of the Hodge brakes not working well before the Springfield brakes were used on that train, or after?

A. Not that I know of.

Q. 14. Between what points did you run on Adams' train?

A. Between Pittsfield and Albany.

Q. 15. Did you or not tell M'r Taylor, the brakeman, not to apply the brakes so far back from the stations, for it took too long a time to stop, and that you would prefer to reverse your engine to assist him in stopping?

A. Yes, sir; I did.

Q. 16. Was this said to M'r Taylor, the brakeman, at a time when he had commenced to brake a long ways back from the station?

A. Yes, and when they had dragged me into the station for a long way.

Cross-examined by S. M. Whipple:

Cr. 1. How long after the Springfield brake was applied to M'r Adams' train did you find by hauling the train that there had been a change in the brakes?

A. I cannot say when I found out exactly. It might have been a month or longer before I heard any fault found.

Cr. 2. So far as holding M'r Adams' train each and every day, do you wish to be understood that you discovered no difference for a month or more?

1443 A. I did not notice any difference for a month or more.

Cr. 3. Did you ever discover any difference in holding the trains, except when you were told by the brakemen that there was a difference?

A. No, sir.

Cr. 4. Are you still in the employ of the Boston and Albany Railroad Company?

A. Yes, sir.

Cr. 5. Did you ever run past stations with the Hodge brake?

A. I cannot say.

Cr. 6. Did you ever run past stations with the Springfield brakes?

A. So far as I knew I did not know one brake from another—only as the brakemen told me.

Cr. 7. So far as you know were you as likely to run by the stations one day as another?

A. Yes, sir; as far as I knew what brakes they were.

Cr. 8. Was there so much difference between the Hodge brake and the Springfield brake that you could tell by stopping the train which brake was on?

A. No, sir; for the reason it might be the fault of the brakeman as well as the brake.

Cr. 9. How many brakemen were on this train?

A. Only two brakemen; the regular train was five cars. Sometimes we ran six or seven cars.

Redirect:

Q. 17. Did you or did you not know that there was a difference in the brakes when the trains did not stop at the stations without the brakemen telling you so?

A. No, sir; for the reason that the brakemen might not have done their duty.

1444 Q. 18. Did you or not ask the brakemen why they did not make as good stops one day as they did another—that you had noticed every other day that they made poorer stops?

A. Yes; I did ask them that.

Q. 19. Was that true that you had noticed that they did not stop as well one day as they did the next—that is, that they made poorer stops every other day?

A. Yes; I did notice a difference some days. I cannot say every other day that they made poorer stops.

Recross-examination:

Cr. 10. May not the brakemen have made poorer stops on the days when the Hodge brakes were used?

A. Yes, as far as I know. I did not know when they had the Hodge brake—only what I was told.

Cr. 11. How many times in a week did you reverse to help the brakemen?

A. I cannot say as to that.

Cr. 12. Would you be as likely to reverse one day as another?

A. Yes, for all I know. I did not know which days I had on the Hodge brake.

Cr. 13. Did you know which days the Springfield brake was used?

A. No, sir; I did not.

Redirect-examination:

Q. 20. In your last answer you say you did not know which days the Springfield brake was used; do you mean that you did not know one brake from another of your own knowledge?

A. No, sir; I did not know one brake from another. That is what I meant.

1445 Recross-examination:

Cr. 14. Do you know anything about the Hodge or Springfield brake used on John B. Adams' train, except what has been told you?

A. No, sir; I do not.

(Objection made to use of this evidence on accounting, by defendants' counsel, as it did not come to knowledge of witness, but is mere hearsay evidence.)

W. GEDDES.

Taken before me, after being duly sworn, this 16th day of October, 1872.

AMASA J. PARKER, J'R,
U. S. Commissioner in and for N. D. of N. Y.

1446 TESTIMONY ON BEHALF OF THE COMPLAINANT, TAKEN AT THE CITY OF NEW YORK.

Deposition of G. A. Fuller, taken at New York, Oct. 8, 1872.

Direct examination by M'r Sayles in person:

Q. 1. What is your name, age, residence, and occupation?

A. G. A. Fuller; age, 45; residence, New York City; occupation, expressman.

Q. 2. Were you employed on the Boston and New York line cars some fifteen or sixteen years ago?

A. Yes, sir.

Q. 3. In what capacity?

A. Through baggage-master from New York to Boston.

Q. 4. Do you remember about that time a certain brake being put on the cars of that line by the Western Railroad Company, called the Springfield brake?

A. Yes, sir.

Q. 5. How did that brake work?

A. Not so well as the brakes that they had had on previously and afterwards.

1447 Q. 6. About how long was this Springfield brake used?

A. About a year.

Q. 7. Did you feel safe on the train while those Springfield brakes were used?

A. I didn't think they were as safe as the old brake. I didn't think they could stop a train as quick. We didn't rely on them as well as we did on the cars that had the old-fashioned brake on that was used before this Springfield brake was put on.

Q. 8. Were the trains stopped as regularly at stations while those brakes were used as they were before and after?

A. Well, there wasn't so much difference in stopping a train at a station, because the engineers would shut off in time to give all the brakemen and baggage-masters time to stop at stations. In them days we didn't have any steam brakes as they have now.

Q. 9. Were those brakes complained of very much by the men running on the trains while they were used?

A. I didn't hear much complaint, because I wasn't with the men on the Boston and Albany Railroad.

Q. 10. I mean on the road that you run clear through on.

A. They didn't like them as well as the old brakes. It is so long ago I have forgotten a great deal about it.

Cr. 1. On what road are you running as an expressman now?

A. Expressman on the Erie road, between here and Paterson.

Redirect:

Q. 11. You spoke of the engineer shutting off so as to give 1448 baggage-masters and brakemen a chance to stop at stations. Did you mean that they shut off further back than they did when they used the other brake?

A. I think they did.

G. A. FULLER.

Sworn to before me this 8th day of October, 1872.

T. B. BEECHER,
Notary Public, N. Y. County.

Deposition of Samuel P. Rand, taken at New York, Oct. 9, 1872.

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Samuel P. Rand. I am locomotive-engineer; reside in New Haven, Conn., and am 49 years of age.

Q. 2. Upon what railroad are you engaged?

A. The New York and New Haven it has been always called. It is now called the New York, New Haven and Hartford Railroad.

Q. 3. How long have you been locomotive-engineer upon that railroad?

A. Since the 27th of November, 1851.

Q. What train at the present time do you run on?

A. The way and express passenger; it is the way one way, down from New Haven, and express up.

Q. 5. Is it the Shore Line express going up?

A. Yes, sir.

Q. 6. What kind of trains have you been running on as locomotive-engineer most of the time since you have been on said road?

1449 A. For the first fourteen months I was on the freight train; since that I have been on the passenger train.

Q. 7. Since you have been engineer on that road, have you run on the New York and Boston night express line?

A. Yes, sir; for twelve or thirteen years.

Q. 8. At any time while you ran as locomotive engineer on that night express line, do you recollect a peculiar kind of brake put on the cars of that line by what was then called the Western Railroad Company of Massachusetts?

A. I do, perfectly well. I couldn't designate the time when it was put on, but I was running the train both before and after, and all the time it was on.

Q. 9. While you ran that train with those brakes on it, how well did said brakes answer:

A. Well, we couldn't depend upon the brakes at all. We had to shut off steam a long ways further back than usual, in order to fetch up at stations or drawbridges. There wasn't much dependence to be placed on the brake. They only run to Forty-second or Thirty-second street with steam, and then they had to run the cars to the depot with horses; and oftentimes they had to cut the horses off—the brake wouldn't hold a single car. They would cut the horses off for fear the car would run over them in going into the yard at the depot.

Q. 10. While these brakes were used on that train, how did you feel as to the safety of the train?

A. Well, we didn't of course feel as safe with what we knew was a poor brake as we did with a good brake. The brake which we were using at that time gave a great deal of dissatisfaction.

Q. 11. Do you recollect an accident happening to the night express train while these brakes were on it?

A. I do, perfectly well.

1450 Q. 12. What was the accident? Please state it fully.

A. I was running the train at that time—coming down from New Haven. We got signals of danger about two miles, I should judge above Stamford. First there was torpedoes—two of them—put on the rail as a signal of danger, and then we got around the curve and saw a red light; I should judge it was fully half a mile from the hind end of the train that we ran into, that I saw the red light. It might have been further. Well, we run into the hind end of the train, as I said. I should judge we were going nearly as fast as we were when we saw the red light. I gave the signals to brake. The caboose car that was on the hind end of the freight train was an old passenger-car. It was one that was broken in two at the Norwalk accident, and they refitted it and put it on for a caboose. Well, the hind trucks of that caboose car was up on the dome part of my boiler—next to the house, and the forward pair of trucks were up on the smoke arch of the engine; the smoke-stack was off in the lot.

Q. 13. To what do you ascribe the failure to stop the train on this occasion in time to prevent the accident?

A. Poor brakes.

Q. 14. What brakes do you refer to when you say "poor brakes"?

A. The brakes put on by the Western Railway Company.

Cross-examination by M'r Whipple:

Cr. 1. Did you reverse your engine at the time?

A. I did, sir.

Direct examination resumed:

1451 Q. 15. In your judgment was the distance from the point where you saw the red light to the place where the accident occurred sufficient or not to have stopped the train, if you had had the kind of brakes on the cars which were on before and after these Western Railroad Company brakes were put on?

A. It is my candid opinion we would have been stopped in half the distance with proper brakes, or with the brakes we used before and since. I think that a quarter of a mile is ample distance for braking, with the train we was running at the time.

Q. 16. Do you know John Charts, now baggage-master on the New Haven Railroad?

A. I do.

Q. 17. Was he a brakeman on the train at the time of this accident at Stamford?

A. Yes, sir; hind brakeman on the train.

Q. 18. While this brake put on by the Western Railroad Company was on that Boston and New York express line which you ran, were any cars with another kind of brake on them run in said train?

A. On leaving New Haven we would take on one of our local cars for the purpose of holding the train.

Q. 19. What kind of brake did those local cars have?

A. The same as we used before and after.

Q. 20. Do you remember the name of that brake?

A. It was called the "Hodge brake."

Q. 21. When taking on a car at the rear of the train at New Haven, as stated, and none of your local cars were convenient for the purpose, what other car, if any, did you frequently put on?

A. We used to take one car that was brought through from Springfield, belonging to the Hartford and New Haven Railroad Company; we would take one of those cars along and let it remain on, instead of cutting off and taking on one of our local cars.

1452 Q. 22. And on such occasions did such Hartford and New Haven car run through to New York on the rear of the train?

A. It did.

SAMUEL P. RAND.

Sworn to before me this 9th day of October, 1872.

T. B. BEECHER,
Notary Public, N. Y. County.

Deposition of Henry Blessing, taken at New York, Oct. 9, 1872.

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Henry Blessing; I am 35 years of age; reside at 127th street, between 9th and 10th avenues, New York, and am engineer in the New York fire department.

Q. 2. Were you ever in the employ of the New York and New Haven Railroad Company; if so, when, and in what capacity?

A. Yes, sir; I commenced there in 1856 as fireman.

Q. 3. Fireman on what?

A. Fireman on the Boston express.

Q. 4. About how long did you work for them as fireman?

A. Well, I worked six or seven years. I didn't commence exactly on the start on the express; I was eight or nine days on another train before I commenced on the express train.

Q. 5. Did you remain on the express train all the rest of the time as fireman?

A. Yes, sir; all the time till I left the road.

1453 Q. 6. You say you were on the Boston express train. Was it the day or night express?

A. On the day-express and on the night-express. On the day-express four months, as near as I can recollect.

Q. 7. And the rest of the time on the night-express?

A. Yes, sir; on the Boston night-express.

Q. 8. While you were fireman on the Boston night-express, who was the engineer that you ran with?

A. Samuel P. Rand.

Q. 9. Do you remember what kind of brakes were on the cars of this night express train on which you ran?

A. Yes, sir; there was a brake they called the "Springfield brake"; and there was another brake there I think they called the "Hodge brake," if I am not mistaken. I won't be positive about that.

Q. 10. Did you run on the train as fireman all the time these Springfield brakes were on?

A. Yes, sir; I believe I did. They were on in the winter of 1856 and in 1857. I was on till coming on 1862. I was all the time on that train.

Q. 11. While these Springfield brakes were used on that train, how well did they answer to hold the train?

A. Well, they didn't act very well; they didn't work well; the men were always finding fault with them. They couldn't make good stops. We often run by stations and water-tanks, and had to back up. The engineer had to reverse the engine and back back, and they always laid it to those Springfield brakes.

Q. 12. Why did the engineer reverse his engine?

A. Well, the brakes wouldn't hold the train. He said that was the cause of it. I know I often used to take hold of the brake on the tender to help brake the train up when I saw the train running by stations, the engine being reversed at the same time.

1454 Q. 13. Do you remember, while these Springfield brakes were used on that train, of any accident happening to the train while you were on it?

A. Yes, sir.

Q. 14. Please state what that accident was.

A. Well, we run into the tail-end of a train the other side of Stamford, coming from New Haven—a freight-train ahead of us. They were stopped there, and they came back with a torpedo and put it on the track, and had a red signal to stop; and the engineer he shut off and reversed his engine, and pulled open the sand-pipes—that is, to let the sand run down on the track, and I put the brake on the tender, and he blowed for the brakes. The consequence was, we didn't stop; we run into the freight-train, and there was a caboose-car on the tail-end of the train. We struck that first and smashed it all to pieces, and broke several other cars. The truck of the caboose-car was drove up on top of the boiler—on the front end of it.

Q. 15. Who was fireman on the engine that ran into this freight-train at this time?

A. I was fireman.

Q. 16. About how far back were you signaled to stop by the red light referred to by you?

A. I don't know exactly how far it was, but I should judge it was a half mile or over. I never measured it, but I should judge it was that distance. I see the distance next day.

Q. 17. What do you think was the cause of the express-train not being stopped in time to prevent this accident?

A. I think those brakes were the cause of it.

Q. 18. What brakes do you refer to by "those brakes"?

A. The Springfield brakes—what they called the Springfield brakes.

Q. 19. If you had had on the train the other brake, which you have called the "Hodge" brake, do you think the distance was suffi-
1455 cient to have enabled you to have stopped the express-train in season to have avoided the accident?

A. Yes, sir; I think it would.

Q. 20. After the Springfield brakes were taken off that train, what brakes were put on in their place?

A. I believe the same brakes that were there formerly.

Q. 21. Called the Hodge brake, do you mean?

A. Yes.

Q. 22. When this Hodge brake was used on the train, how well were you able to stop at stations?

A. Well, they always made very good stops; always made good stops.

Q. 23. Did, or not, the engineer have to reverse his engine to help the train stop at stations while the Hodge brake was used?

A. No, sir; not to my recollection.

Q. 24. While the Springfield brakes were used on this train were cars with other brakes on them running in the train?

A. Yes, sir; we used to take on a car at New Haven on account of those brakes—one of the local cars of the New York and New Haven Railroad—on the tail end of the train, on account of the brakes being bad, to stop the train.

Q. 25. What sort of brake was on these local cars?

A. Well, I don't know exactly the name of the brake that was on those cars, but they were a good brake and never any fault found with them. I don't know the maker's name, nor the man's name that put them on. They was considered a good brake, and considered safe.

Q. 26. Were they, or not, the regular brake that was used on the local cars of the New Haven Railroad?

A. I believe they were the regular brake that is used on the local trains.

1456 Cross-examined by Mr Whipple:

Cr. 1. Was there on this train, at the time of the accident referred to by you, one of the local cars of the New Haven Railroad?

A. Yes, sir; I believe there were, to the best of my knowledge—to the best of my memory.

Cr. 2. Was this brake applied at the time of the accident?

A. Well, that I couldn't say.

Cr. 3. Was there any of the brakes of that train applied at the time?

A. Well, that I couldn't say. I wasn't on the train; I was on the engine.

Cr. 4. Why was the Hodge brake taken off from that train and the

Springfield brake put on; and then afterwards that taken off and the Hodge brake put on in its place?

A. All I knew about that was, I heard there was some difficulty about the brakes.

Cr. 5. From what source did you understand this difficulty to come?

A. Well, that is a question I couldn't answer. I never made any inquiries about that.

HENRY BLESSING.

Sworn to before me this 9th day of October, 1872.

T. B. BEECHER,
Notary Public, N. Y. County.

(Counsel for complainant notifies defendants' attorney that as these last two questions of the cross-examination are upon new matter, he makes the witness his own and will be held bound by them.)

1457 *Deposition of Edward S. Renwick, recalled on the part of complainant, taken at New York, Oct. 25, 1872.*

Direct examination by M'r Cozzens:

Q. 1. Please state whether you have examined any drawings or diagrams representing the car-brake known as the Springfield brake; and, if yea, whether you understand the construction and operation of that brake?

A. I have examined the diagrams, and believe that I understand the construction and operation of the brake as represented in them.

Q. 2. Please state what disadvantage, if any, would, in your judgment, attend the use of a brake like the Springfield brake in practice?

A. In my opinion, such a brake would not be a reliable one for stopping trains under the ordinary circumstances which occur in practice, because the construction of it is such that in cases which are continually arising in practice the whole strain from one of the brake standards would be thrown upon the shoes of one truck, and in case the brakeman had applied the shoes of both the trucks while the car was running upon a straight portion of the track, a transference of the car from such a straight portion to a curve would have the effect of slacking the strain upon the shoes of one truck, and of greatly increasing the strain upon the shoes of the other truck, so as, in all probability, to cause the wheels of such truck to slide upon the track. In fact, I should regard the Springfield brakes as less reliable than single brakes for the purposes of stopping a train under the cases which ordinarily occur in practice, and that the incidental disadvantages of a defective brake system—such as the risk of collisions and the injury of the wheels by sliding—would be greater with the Springfield brake than they
1458 are with the ordinary single brakes which were in use before the present system of double brakes.

Q. 3. Will you please state what it is in the construction of the Springfield brake which causes these results you have referred to?

A. In the Springfield brake the connections between the brake levers of each truck and the windlass at one end of the car are at the same side of the central line of the car. Now, when the railroad car is running upon a curved portion of the track the two trucks are canted in reference to the central line of the car, and the canting of the two trucks is in opposite directions; hence the effect of this canting is to shorten the distance between the brake lever of one truck and its brake standard, and to lengthen in a corresponding degree the distance

between the brake lever of the other truck and the same brake standard. Hence, if the brakes were applied properly when a car was running upon a straight portion of the track, and after such application the car passed to a curved portion of the track, the canting of one of the trucks, by increasing the distance between its brake lever and the brake standard, would greatly increase the strain upon the brake system and brake-shoes of that truck, while the strain upon the brake system and brake-shoes of the other truck would be reduced in like proportion. On the other hand, if the brakes were applied while the car was running upon a curved portion of the track, the brake-shoes of that truck whose brake lever was canted furthest from the brake standard would be brought into operation and pressed against the wheels to the greatest required extent, before the brake-shoes of the other system could be brought to bear against their respective wheels; so that practically, in such cases, the brake-shoes of only one of the two trucks of the car would be available for the purpose of stopping the car.

1459 Q. 4. Would a brake operating in this way be in your judgment a practical brake for a double-acting brake?

A. In my opinion it would not, because in cases which continually occur in practice of the passage of cars from straight portions of the road to curved portions—while the brakes are applied—and of the application of the brakes while the cars are running upon curved portions of the track, the brake-shoes of only one truck would be borne forcibly against their wheels, and the presumption is that in a majority of cases they would be borne against their wheels with sufficient force to cause the wheels to slide while the wheels of the other truck continued to revolve. In addition to the difficulty arising from the variation in the distance due to the canting of the trucks, the presumption is that a greater strain would be applied by the brake standard itself to the brake system of one truck, during such canting, when the car passes from a straight to a curved portion of the track, than to the brake system of the other, from the fact that the brake standard is mounted upon a wooden framing which is the wooden framing of the car and which is more or less elastic; consequently when the variation in distance arising from the canting of the trucks relaxed the strain upon the brakes of one truck, the elasticity of the frame-work of the car would in all probability cause an increased amount of strain to be applied to the brake system of the other truck.

**Q. 5. Assume that in the diagram marked "Hervey Waters' Radius Diagram Sheet No. 1," the radius of one of the curves there represented is 500 feet, and that when a car having upon it the Springfield brake passes from a straight track on to a curve of 500 feet radius, the relation of the top of the truck-lever to the windlass at one end of the car is varied an inch and a half at one end, and that the relation
of the top of the lever of the other truck to the same windlass is
1460 varied, say an inch and a quarter in the opposite direction; please
state how serious in your judgment would be the effect of these variations upon the wheels of the trucks in reference to efficient braking of the car?**

A. The effect would be substantially the same as that produced by making the connection between the brake standard of the one truck 2¾ inches longer than the connection between the same brake standard and the other truck when the car was running upon a straight portion of the track. The result in my opinion would be so serious that if the brakes had been applied when the car was running upon a straight portion of the track, the passage of the car to a curve of the radius mentioned

would, in all probability, so increase the strain upon the brake-shoes of one truck that the wheels would be forced to slide upon the track, while it would slack the strain upon the brake-shoes of the other truck. On the other hand, if the brakes were applied while the car was running upon a curve of the radius mentioned, the brakesmen might readily apply sufficient force to prevent the revolution of the wheels of one truck, without materially affecting the revolution of the wheels of the other truck.

Q. 6. Will you now look at "Hervey Waters' Radius Diagram Sheet No. 2," and answer the same question, on the assumption that the curve shown on said diagram sheet is of a radius of 800 feet, and that a car with the Springfield brake upon it properly applied upon a straight track, and passing upon said curve, causes an aggregate variation in the relations of the tops of the brake-levers in each truck to the windlass from which the power is applied, of about an inch and a quarter?

A. The risk of sliding the wheels of one truck would in such case not be so great as in the preceding case with the radius of 500 feet; but still a much greater amount of pressure would be applied to the brake-
1461 shoes of one truck than to those of the other, and there would be considerable risk of causing the wheels of one truck to slide; and the brake-shoes of the wheels of the other truck would not be applied with nearly as great force as they would be if they had been operated by a separate brake standard, as in the single brake system, and would not be as effective in stopping the motion of the train.

Q. 7. If, then, the effect of this variation on an 800 feet curve was to cause the wheels of one truck to slide, and the brake shoes of the other truck to be materially slackened in their pressure, would, or not, such a brake in your judgment be a practical brake to use on railroads?

A. Whether it would or would not be a practically valuable brake would depend upon circumstances. If no other brake system was known, the Springfield brake would be a valuable system; but if the single brake system were known, I should regard the Springfield brake system as of less value practically than the single brake system, because there would not only be a greater risk of causing the wheels of one of the trucks to slide, but it would be relied upon to do more work than the single brake system—while in point of fact it would be less reliable and more likely to increase the expense of running trains than the single brake system.

Q. 8. You have, in your previous examination upon this accounting, stated certain defects which exist in the single brake system. Will you also state the reason why the Springfield brake would be less reliable than said single brake system—although the latter has the defects referred to?

A. It would be less reliable than the single brake because one of the defects of the single brake system could be obviated, to a certain extent, by increasing the number of brakesmen; but in the Springfield system an increase in the number of brakesmen would really increase the risk of sliding the wheels of one truck, because the effect of the cant-
1462 ing of the trucks upon a curve would be to throw the strain from both brake standards upon the brake shoes of one truck. Moreover, the increase in the number of brakesmen operating the Springfield brake would for the same reason not increase the number of shoes which were brought properly into action by the operation of those brakesmen. Whereas, in the single system the increase in the number of brakesmen would increase the number of brake shoes brought into practical operation.

Q. 9. Also please state why it is that the Springfield brake—although it is an attempt to operate upon both the trucks of a car—is an inferior brake system as compared with a single brake at each end of a car with a brakeman at each of such single brakes.

A. It is inferior for the reason that in the Springfield brake both trucks of the car are connected with both brake standards, and the change in the relationship of the brake levers of the two trucks to one standard arising from the canting of the trucks when the car is running upon curved portions of the track is attended with a corresponding and equal change in the relationship of the brake levers of the two trucks to the other brake standard, but in the opposite direction—so that the connections of the brake levers of one truck with both brake standards would be shortened, while the connections of the brake levers of the other truck with both brake standards would be correspondingly lengthened. Hence, if under such circumstances with the Springfield brake a brakesman was to operate at each brake standard of a car, the force of both would be applied mainly, if not wholly, to the brake system of one of the trucks—instead of being applied separately to the brake systems of the two trucks as would be the case with two brakesmen operating upon a car having a separate brake for each truck.

Q. 10. You have fully stated the effect produced upon the
1463 Springfield brake by the canting of the trucks of the car when
the latter passes from a straight track on to a curve. Now, please state what effect is produced upon the brakes of the trucks of a car running under the same circumstances having a single brake at each end of it?

A. In the single brake system there would be more or less variation in the pressure of the brake shoes that were in operation, arising from the passage of a car from a straight track to a curved one—such variation arising from the canting of the truck and the consequent change in the position of the brake lever relatively to its brake standard. But inasmuch as the brake system of only one truck of each car is connected with one brake standard, such variation in the pressure of the brake shoes of one truck could not affect the brake shoes or the wheels of the other truck.

Q. 11. If then the variation in the pressure of the brake shoes of one truck with the single brake would not affect the shoes of the other truck, and if the defect existing in the single brake of not applying to more than one truck at a time could, as you have above stated, be obviated to a certain extent by increasing the number of brakemen—will you please state why it is in your judgment that notwithstanding these facts the single brake system is not as efficient for the purpose of braking a car as the double brake system embodied in the Tanner patent?

A. Because, setting aside the increased cost due to the necessity of employing double the number of brakesmen in order to bring the same number of shoes into operation with the single brake system as could be brought into operation with the Tanner system, the risk of sliding the wheels with the single brake system is greatly more than it is with the Tanner system for the reasons given by me in my previous examination on this accounting; and as a consequence, although it is possible
that a train with the single brake system could be stopped as
1464 efficiently as with the double brake system, yet it is not at all
likely that it would be in practice; and the presumption is that in a great majority of cases the train would not be as effectively stopped with the single brake system with double the number of brakesmen as

with brakes upon the Tanner system. An increase of the number of brakesmen also reduces the chances of simultaneousness in applying the brakes—so that although it is possible that the brakes of a train having the single brake system could be applied as simultaneously as those of a train having the Tanner system of brakes, it is not at all likely they would be in practice in a majority of cases.

Q. 12. Please state whether or not there is anything in the combination and arrangement of the levers in the Tanner brake which practically obviates the defective results which you have spoken of as existing in the single brake and in the Springfield brake when a car with its brakes properly applied on a straight track passes on to a curve; if so, what is it?

A. There is—namely, an arrangement of the brake levers of the trucks substantially in a line passing through the king bolts of the trucks and the long connections between those brake levers and the central lever with which the brake standards are connected. In consequence of this arrangement of the brake levers and connections, the canting of the trucks when the car is passing from a straight portion of a track to a curve, or when the car is on a curve, produces an insignificant effect in the relationship of the brake levers to the central lever through which the force is applied from the brake standards.

(Cross-examination waived.)

E. S. RENWICK.

1465 *Deposition of Cornelius Van Demark, taken at New York, Oct. 25, 1872.*

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. Cornelius Van Demark; I am about 45 years of age; I live in Jersey City, and am foreman of car repairs on the Pennsylvania Railroad at Jersey City—foreman of car inspecting for the Pennsylvania Railroad at Jersey City.

Q. 2. How long have you been engaged in that duty?

A. Since the 1st of July last—1872.

Q. 3. How long in all have you been employed on a railroad, and what railroad?

A. I have been employed on the New Jersey Railroad for about 20 years. Since I first came there I have been away; I was in the government service; had charge of car repairs for nearly two years at Chattanooga, during the war.

Q. 4. As foreman of car inspectors at Jersey City, what, at the present time, and what, since the 1st of July, 1872, have been your duties?

A. My duties are to see that the cars that arrive are properly repaired; the western lines principally—western and Washington lines.

Q. 5. The cars of what companies, including the cars which formerly belonged to the New Jersey Railroad Company, compose these various lines which are under your charge?

A. The cars are principally composed of Pennsylvania Railroad cars, together with the Washington lines, the Camden and Amboy, and Philadelphia, Wilmington and Baltimore cars.

Q. 6. In the cars which you speak of as Pennsylvania Railroad cars, do you include the cars which formerly belonged to the New Jersey Railroad?

1466 A. No, sir; I have very little to do with those—not at all, scarcely.

Q. 7. What kind of double brakes are in use on the cars of these trains which you say are under your charge?

A. On the Pennsylvania cars the double-lever brakes are principally in use—in fact, on all of them; the Hodge brake, I believe, is the name of it.

Q. 8. How on some of the other cars which are under your charge?

A. On the Washington lines—those formerly that belonged to the Camden and Amboy and New Jersey Railroads are composed of the single centre-lever brake, and on the Philadelphia, Wilmington and Baltimore road the Stevens brake.

Q. 9. Do your duties as car inspector of these cars you have mentioned cause you to be familiar with the adjusting of these various brakes you have named?

A. They do.

Q. 10. Will you please state about how often on an average you find it necessary to adjust the centre-lever brakes in the cars which are under your charge in the Washington lines?

A. Well, I never kept a particular account. I should judge it was about once in two to three weeks.

Q. 11. When you do adjust them, what do you have to do to them?

A. Merely screw up the nuts of the connecting rods on the brake-bars or brake-beams.

Q. 12. When you screw up the nuts of these connecting rods on these brake-beams of a car, about how long does it take you on an average?

A. Five to ten minutes.

Q. 13. About how often on an average do you find it necessary to adjust the Hodge brakes which are under you charge?

1467 A. I couldn't hardly answer that question, because on the western lines our cars are gone from three to eight days, and I have generally adjusted them every trip they came in.

Q. 14. Do you consider it to be necessary to adjust the Hodge brake as frequently as this?

A. Well, it is necessary, or I should not do it.

Q. 15. If you are called upon to put on new brake-shoes, how much time does it take to do it on a car having a centre-lever brake, as compared with a car having the Hodge brake or the Stevens brake?

A. About the same time; I don't think there is any difference; I can put it on one as quick as on the other.

Q. 16. When you are required to put on to a car either new wheels or new brake-beams or new brake-shoes, which brake, at such times, requires the nicest adjustment, the centre-lever brake or the Hodge brake?

A. The centre lever brake requires the nicest adjustment, and is the one which we are most particular about.

Q. 17. But after the centre-lever brake is adjusted under the circumstances just inquired about, how often on an average do you say it requires to have its adjustment regulated?

A. Once in two to three weeks, I should judge.

Q. 18. Will you please state how the centre-lever brake holds the cars as compared with the Hodge brake or the Stevens brake?

A. From my personal knowledge I could not answer that question, for I have never broke on them only as to try the brake. It takes less time to apply the brake with the single centre lever than it does with the double-lever brake—that is, the Hodge brake.

Q. 19. With such experience as you have had in trying the centre-lever brakes, as you say, how do you think they hold the cars as compared with the Hodge brake and the Stevens?

A. I think they hold them just as well.

1468 Q. 20. You say you can apply the brake quicker with the centre-lever brake than you can with the Hodge brake? Will you please state why this is?

A. You have not so much chain to wind up; you can brake direct on to the brakes without taking up the slack of the chain at both windlass-shafts.

(Cross-examination waived.)

CORNELIUS VAN DEMARK.

Sworn to before me this 25th day of October, 1872.

T. B. BEECHER,
Notary Public, N. Y. County.

Deposition of John P. Van Doren, recalled on the part of the complainant.

Direct examination by M'r Cozzens:

Q. 1. You have heretofore testified in this case that you have charge of the cars constituting the New York and Washington through lines, running over the New Jersey, Philadelphia, Wilmington and Baltimore, and Baltimore and Ohio Railroads?

A. Yes, sir.

Q. 2. Please state whether, as a part of your duty in superintending and looking after the cars of these lines, you have to attend to the adjusting of the brakes upon said cars.

A. Yes, sir.

Q. 3. Please state what kinds of double-acting brake are the ones you have had charge of on those roads.

A. We have a centre-lever—I believe they call it the Tanner;
1469 I never call them by their names; and there is the Stevens—
two levers in each truck and a rod running from one truck to the other.

Q. 4. Will you please state about how often you have to adjust the "centre-lever" or Tanner brake on said cars?

A. Some cars we have run a month where we have not had to alter them.

Q. 5. Taking one centre-lever car with another, and one week with another, about how frequently on an average do you have to adjust the centre-lever brakes on said cars?

A. Not over two weeks at an average.

Q. 6. Not over once in two weeks?

A. No, sir.

Q. 7. About how frequently do you have to adjust the Stevens brakes on these New York and Washington cars on an average?

A. I don't think quite as often again. We have to oftener on account of the short curves on the road, which give us more trouble with the Stevens brake.

Q. 8. When you do adjust the centre-lever or Tanner brake not more than once in two weeks on an average, as you have stated, what is it that you do to it to adjust it?

A. Screw up the nut on the brake-beam a little—both trucks equally.

Q. 9. About how long does it take, ordinarily, to adjust the nuts on these two trucks?

A. About ten minutes; if they get chocked very tight it might take a little longer, but, as a general thing, about ten minutes.

Q. 10. Is there anything else than this that you have to do ordinarily in adjusting the centre-lever brakes?

A. That is all.

Q. 11. If you are called upon to put new brake-shoes on to cars having the centre-lever brake, does it or not take you any longer to 1470 put them on than it would with a car with any other kind of double brake on it?

A. About the same time.

Q. 12. Is the air-brake, or, as it is called, the Westinghouse brake, in use on any of the cars which form part of the New York and Washington through lines?

A. Yes, sir.

Q. 13. Is there any full train which runs in those lines for any part of the distance between New York and Washington which is equipped with the air-brake?

A. We have one; we have the Camden and Amboy cars together—which we have had on the morning line; we have had it so that those cars went out all with the same brakes.

Q. 14. How far do those cars run?

A. To Philadelphia.

Q. 15. Then, as I understand you, there are six cars which compose one of the New York and Washington air-line trains as far as Philadelphia with the air-brake on them?

A. They have been in some mornings, but we don't keep it regular. We have been short of cars and we have had to mix them up. It has run out several times when we could use sometimes four and sometimes five cars.

Q. 16. On these cars which have this air-brake, what form of double brake is the air-brake applied to?

A. To the centre-lever or the Tanner brake.

Q. 17. Please state how the air-brake works with the centre-lever double brake?

A. Just as well as the other; the hand-brake, I think, works better.

Q. 18. What do you mean when you say "the other"?

A. I mean the Westinghouse or the other; either one.

1471 Q. 19. What do you mean when you say that the Westinghouse brake works as well with the centre-lever double brake as it does with "the other"? What do you mean by "the other"?

A. I mean the Hodge brake.

Q. 20. Will you please state how the centre-lever or Tanner brakes hold the cars, as compared with the Stevens brakes?

A. On our trains they hold better; they do not have to have so much slack as on the other cars—on the double-lever or Stevens brakes—to run short curves.

Q. 21. And you say they hold better than the Stevens brakes?

A. Yes; on account of they do not have to have so much slack on the curves.

(Cross-examination waived.)

JOHN P. VAN DOREN.

Sworn to before me this 25th day of October, 1872.

T. B. BEECHER,
Notary Public, N. Y. County.

1472 TESTIMONY ON THE PART OF THE COMPLAINANT TAKEN AT JERSEY CITY, NEW JERSEY.

Deposition of Abraham Parmer, taken at Jersey City Oct. 26, 1872.

Direct examination by M'r Sayles in person:

Q. 1. What is your name, age, residence, and occupation?

A. Abraham Parmer; I am twenty-eight years old; residence, Jersey City, New Jersey; I am a brakeman on the Pennsylvania Railroad, running between New York and Philadelphia.

Q. 2. How long have you been brakeman on said road, and on what trains?

A. I have been seven years a brakeman on said road; on freight-trains, and on passenger; about three years and a half on passenger-trains—the last three and a half years.

1473 Q. 3. What kinds of brakes have been used on the passenger cars on which you have been brakeman?

A. I have used the Hodge brake, the single lever brake, and the Stevens brake.

Q. 4. Please state how the single lever brake compares with the Hodge brake and the Stevens brake in holding a train of cars.

A. The single lever brake and the Hodge brake is very near alike. The single lever brake works the easiest. The Stevens brake I don't like at all—it is not good for much.

Q. 5. Do you mean by the single lever brake the brake that is in general use on the New Jersey Railroad cars?

A. Yes, sir.

Q. 6. Are the Westinghouse air brakes used on any of the cars having on the Hodge brake or the single lever brake on the trains on which you have been brakeman?

A. Yes, sir; they are used on both.

Q. 7. You say the single lever brake you think works easier than the Hodge—do you or not mean when the Westinghouse brake is attached to it?

A. The single lever works the easiest when the Westinghouse brake is attached.

Q. 8. When the Westinghouse brake is not attached to either, which brake—the Hodge or the single lever brake—can you stop the train the quickest with, if there is any difference?

A. Well, one is as good as the other when the Westinghouse brake is not attached. The single lever brake does not require so much winding of the windlass as the Hodge. The single lever brakes work the easiest; that is, do not require so much winding up, when they are both in order. I like one as much as the other.

Q. 9. You say you do not like the Stevens brake; what appears to be the difficulty with it?

1474 A. They have to have too much chain to it, in the first place. Another thing, there is no lever to have any purchase on, and the rod is so long that it strikes the post generally before you can get the brake up. The post is the windlass shaft on which the chain winds.

Q. 10. Do you mean that there is no horizontal lever under the body of the car?

A. There is no lever on the Stevens brake at all; nothing but a long rod.

Q. 11. Are there not levers in the trucks where Stevens brakes are used?

A. No, sir; there are truck levers between the brake beams.

Q. 12. You, in speaking of the Stevens brake, say there is too much chain; do you or not mean by that that you have to wind up the windlass more than with the other brakes you have spoken of?

A. Yes, sir; you have to wind up the windlass more where there is more chain.

Q. 13. Have you or not noticed in working the Stevens brake that the chain in winding around the windlass so much would overlap the chain, or wind over the chain, and thus partly destroy the power of the brake?

A. Yes, sir; it does. I find when it lops over it binds and you cannot get it up.

Q. 14. Do you or not remember a brake being put on a passenger car on the New Jersey Railroad, numbered 93, some time last winter or spring, called the Tpringfield brake?

A. I do, and it was good for nothing.

Q. 15. Did you have occasion to brake any on that car while that brake was on it?

A. I had, once.

Q. 16. How did it work in stopping the train?

A. Didn't work very good. It is a brake I don't know much about. I never used it only one stop. It wouldn't hold. They didn't keep it on long.

1475 Q. 17. What train are you brakeman on now?

A. 9.30 a. m., out of here, Western and Philadelphia express, and the 1.30 from Philadelphia, through Washington express.

(Cross-examination waived.)

his
ABRAHAM + PARMER.
mark.

And being sworn and subscribed before me this 26th day of October, A. D. 1872.

J. N. BLAIR,
Master in Chancery of New Jersey.

Deposition of Ephraim F. Hall, taken at Jersey City, October 26, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. My name is Ephraim F. Hall; age, 43 years; residence, Newark, New Jersey; I am a carpenter by trade; I am now a car inspector on the Delaware, Lackawanna and Western Railroad, Morris and Essex division.

Q. 2. How long have you been employed on railroads, and in what capacities?

A. About 15 years, on different railroads; I used to work on the Erie road; I worked on passenger cars; building of cars. I worked on the Chattanooga and Nashville road, in Tennessee—about 1863 or 1864 I worked there; I worked for the government on this road; during the war I worked on the Louisville and Nashville, the Nashville and Chattanooga, and I think the Nashville and Northwestern Railroads.
1476 It was all under the government, and all one thing to me; I was there about a year, more or less.

Q. 3. What kind of brakes are used on the passenger trains on the Morris and Essex Railroad?

A. We have three different kinds of brakes there; the Stevens brake, the Hodge brake, and a centre lever brake.

Q. 4. How long have you been on the Morris and Essex road, and in what capacities?

A. About eight years. I first went to work at general repairs for about a month; was then put in as foreman of general repairs; was foreman about five years as near as may be; since then car inspector at Hoboken.

Q. 5. How long has the Hodge brake been used on the Morris and Essex road?

A. About six years, as near as I can remember.

Q. 6. What was the occasion of the Hodge brake being put on the Morris and Essex road?

A. It was in connection with the Loughridge steam brake.

Q. 7. What brakes were used on that road before the Loughridge brake was put on the cars?

A. We used the centre lever brake, and the Stevens brake; these were the two brakes we used.

Q. 8. Did you ever have occasion to apply those brakes in stopping at stations?

A. I have.

Q. 9. Please state which of those brakes you preferred?

A. I preferred the centre lever brake, for my part.

Q. 10. Why did you prefer that?

A. Well, I prefer them because there is less slack of the chain to be taken up to get a bearing of the brake; it's quicker applied, and it's less trouble to keep in repair; that is why I should prefer it.

Q. 11. In regard to holding the train in making stops at stations, how did the centre lever brake compare with the Hodge and Stevens brakes?

1477 A. Well, according to my judgment it was as good as either. I always found it so.

Q. 12. Please state about how often you have found it necessary to adjust the centre-lever brakes to keep them in good order?

A. On trains running all the time, about once in three weeks, with the natural wear.

Q. 13. When you do adjust them what do you have to do, and how long a time does it require to do it?

A. Well, I have to take off the bottom rod on each truck; it takes about ten or fifteen minutes; it's a short job.

Q. 14. About how often does the Hodge brake require to be adjusted to keep it in good working order?

A. It wants to be adjusted about once a week.

Q. 15. Will you please state why it is that the Hodge brake requires to be adjusted oftener than the centre-lever brake?

A. Because they have just twice as much slack to take up as there is in the centre-lever brake, and a little wear gives it just twice as much slack as the other.

Q. 16. What kind of brakes were used on the passenger trains when you were employed for the government, in Tennessee where you have spoken of?

A. The most of them were the centre-lever brakes that were then used; nearly all, except one or two.

Q. 17. Were these centre-lever brakes used on all the cars of the Louisville and Nashville road?

A. I can't say on all the cars, but on those we repaired they were; that is far as I can say; they were in general use on the road.

Q. 18. Is the Louisville and Nashville one of the most important roads in the South?

A. Yes. sir; I believe it is; so said, at any rate.

Q. 19. How well did the centre-lever brake work in holding the trains on the Southern roads you worked on?

1478 A. I believe they worked very well—at least, the brakeman said so—when they were in order.

Q. 20. In what capacity were you employed on these Southern roads you have spoken of?

A. I was what was called a gang-boss, or foreman of a gang of men repairing cars.

Q. 21. Did this employment, then, enable you to know how the brakes worked?

A. No, not personally; but only by the brakemen reporting when they came in on the trains. They generally reported when they came in.

Q. 22. Was it in the line of your employment, then, to learn how the brakes worked, and to learn when they were out of order and needed adjusting?

A. Yes; not directly but indirectly. There was a man to whom it was reported by the brakeman, and it came to me through him. This is the way on all roads.

Q. 23. When these reports came to you that the brakes needed repairing or adjusting, whose duty was it to order the brakes adjusted or repaired?

A. I had charge of a gang of men, and it was my duty to do it. When I was told that the brakes wanted repairs it was my duty to fix them. We never used the word "adjusting," but "repairs" covers everything. "Repairs" covers "adjusting." We don't use the word "adjusting." "Fixing" is the word we use.

Q. 24. How did the adjusting or fixing the brakes on the Southern roads on which you worked compare as to frequency with the adjusting or fixing the centre-lever brakes on the Morris and Essex road, as you have stated?

A. About the same. Not much difference between the two.

Cross-examination by M'r Whipple:

Cr. 1. As near as you can recollect, what number of passenger-
1479 cars with the centre-lever brakes on them were there in use when
you were employed by the government?

A. I don't know exactly the number, but as near as I can recollect about forty passenger-cars at one time. Sometimes not so many—they were burned up sometimes—but I think about forty.

Cr. 2. Did all these forty passenger-cars have the centre-lever brake applied to them?

A. I think the majority of them did, as near as my memory serves me.

Cr. 3. What brake was on the minority?

A. Well, they had a single brake on either end.

Cr. 4. From what road did the government take these cars with the single brake?

A. Well, I don't know. I can name some of them. Some were from the Louisville and Nashville road, and some were from the Nashville and Chattanooga.

Cr. 5. Do you know anything of the operation of the centre-lever brake on the cars of the aforesaid road other than what was told you?

A. No, sir; I have no way to know it. I had no way to know it. I didn't use them any more than to repair them in the shop, and when we repaired them we tried them to see if they were right.

Cr. 6. Did you as a boss of a gang of men make a personal trial of the brakes when repaired, or did you leave that work to your men?

A. I did; I generally did that myself.

Cr. 7. Did you try these brakes so repaired out on the road, for the purpose of checking the trains?

A. No, sir.

Cr. 8. Do you mean by adjusting the brakes, taking up the wear of the shoes by turning up the nuts on the brake beams?

A. Yes, sir; that is what I mean by adjusting the brakes, taking up the slack, we call it.

Cr. 9. You are obliged to take up the slack in the Hodge brake once a week, are you?

1480 A. Yes, sir; when the train is running steadily.

Cr. 10. And you have to take up the wear or slack of the centre-lever brake once in three weeks when the train is running steadily?

A. Yes, sir; that is about the time, as I am using them now.

Cr. 11. You say you are now using the centre-lever brake; is the connection from the windlass to the centre-lever and the truck-lever connection on a line with each other, or are the truck-levers connected with the centre lever at a short distance inward from the end of said lever?

A. One of the rods from the truck-lever is connected to the end of the lever in the centre of the car; the other end of the centre lever is connected to the windlass; the other rod, that runs from the other truck at the opposite end of the car, is connected between the end that is connected with the windlass and the centre-pin of the centre lever.

Cr. 12. What is the length of the centre lever?

A. It is about three foot long—two foot ten inches, or about in that neighborhood.

Cr. 13. In making the connections with this centre lever, less than three feet long, do you make them at the end of the lever?

A. We make the connection with the windlass or brake-shaft at the end of the lever.

Cr. 14. Where do you make the brake-shaft connections?

A. About half the distance from the end of the centre lever to the centre-pin the lever revolves on; the connections of the other half are the same, if it is a double brake.

Cr. 15. Is the centre lever used as a double brake on the passenger-cars of the Morris and Essex road? If so, to what extent?

A. I believe it not used there now. They have taken it off; they did use it.

Cr. 16. Why was it taken off?

1481 A. It was taken off to apply the steam-brake.

Cr. 17. You speak of using one centre-lever brake; on what car do you use it?

A. Smoking-car of the Delaware, Lackawanna and Western Railroad—broad guage.

Cr. 18. Do you run on the smoking-car as brakeman?

A. No, sir; I do not.

Cr. 19. Do you know anything of the operation of this one brake you have described?

A. Only from the baggage-master who used it.

Cr. 20. How were the connections made with the centre-lever brake when used by the Morris and Essex Railroad Company before applying the Loughridge brake?

A. They were connected by a lever in the centre of the car, and connected from each end to a rod running to the brake-shaft at each end of the car; they were about half way from the end to the centre of the centre lever, by a rod running to each truck-lever.

Cr. 21. Are there any cars on that road except the smoking-car you have named that has the centre lever on as you have described?

A. We have some box-cars, but no passenger-cars; we have one derrick-car that the centre lever is on.

Cr. 22. Are you quite sure that the connection of the truck-levers with the centre lever is equidistant between the end and the centre of the centre lever?

A. No, sir; I am not, for I didn't measure.

Cr. 23. How near to an equidistant to the two points named in the above question is the connection?

A. Couldn't tell you; the one I put on myself is as near equidistant as may be; of the rest, I don't know.

Cr. 24. How many inches should you judge the truck-lever connection was from the end of the centre-lever, as used on the Morris and Essex road before applying the steam-brake?

1482 A. I used to make them from 8 to 10 inches; about 8 inches on an average.

Redirect:

Q. 25. In adjusting the centre-lever brake when first attached to a car—and the Hodge brake when first attached to a car—which requires the nicest adjustment?

A. The centre-lever brake requires the nicest; we are more particular to get it exact.

Recross:

Cr. 25. Is the Hodge brake self-adjusting in its character, or does it have to be adjusted from time to time after it has been applied to a car?

A. It has to be adjusted, or fixed as we call it—the slack taken up to keep in good order.

EPHRAIM F. HALL.

Sworn and subscribed before me this 28th day of October, 1872.

WILLIAM A. BLAIR,
Master in Chancery of New Jersey.

Deposition of George W. Brown, recalled for complainant, taken at Jersey City, October 28, 1872.

Direct-examination by M'r Cozzens:

Q. 1. Please state what is the length between windlass-shafts of the passenger-cars of the New Jersey division of the Pennsylvania Railroad on which you are employed?

A. About 50 feet to 55 feet, or somewhere thereabouts; all according to the length of the cars.

1483 Q. 2. What is the distance between the ends of the body of the cars, excluding the platforms?

A. About 48 feet to 50 feet, according to the car.

Q. 3. How many wheels in the trucks under the passenger-cars of the said New Jersey Railroad?

A. Twelve wheels under the old cars—six wheels in one truck.

Q. 4. What is the length of these six-wheeled trucks?

A. About 9 feet.

Q. 5. Please state what is the length of the four-wheeled trucks under the passenger-cars of the Pennsylvania Railroad that come into Jersey City?

A. About 9 feet 4 inches to 9 feet 6 inches.

Q. 6. In the centre-lever brakes used on the passenger-cars of the New Jersey Railroad what is the length of the centre levers?

A. About 45 inches.

Q. 7. In these centre-lever brakes on the New Jersey Railroad what is the length of the connections from the centre-levers to the tops of the truck-levers when the said truck-levers are placed at the inside ends of the trucks?

A. About fifteen feet, more or less.

Q. 8. What is the length of these same connections when these levers are placed at the outside ends of the trucks?

A. About twenty-*two* feet. It might be a little more or a little less, according to the car.

Q. 9. Please state which brake, the centre-lever brake or the Hodge brake, when first applied to a car, requires the nicer adjustment.

A. The centre-lever brake, I think.

Q. 10. After the centre-lever brake is attached to a car, about how often does it require adjustment to keep it in order when the car is in use?

A. About every three weeks it ought to be, to keep it in order. When the brake-shoes wear off we have to take up the slack.

1484 Q. 11. In adjusting the brake at these times, or taking up the slack, what is done to it?

A. We screw up the nuts on the connecting-rods that connect the two brakes together with the truck-lever.

Q. 12. About how long on an average does it take to do this?

A. From ten to fifteen minutes.

Q. 13. How does the centre-lever brake compare with the Hodge brake in reference to the quantity of slack-chain to be wound up in applying the brakes?

A. The Hodge brake has more slack-chain than the centre-lever brake.

Q. 14. Does this fact give either of the brakes any advantage over the other in the application of them to the wheels; and, if so, to which one does it give the advantage?

A. To the centre-lever.

Q. 15. What is the effect of this advantage in the centre-lever brake in reference to the application to the wheels?

A. There is less chain to wind on the shaft. It takes effect sooner after applied.

Q. 16. Which brake, then, can be made to apply to the wheels the quickest?

A. The centre-lever brake, I think.

Q. 17. How does the centre-lever brake compare with the Hodge brake in regard to holding the trains when applied?

A. That I can't say. Never had the experience to try them. Never was brakeman.

Q. 18. What experience have you in reference to the matter of the effect of the centre-lever brake in holding the cars?

A. I have often seen it applied when the trains are in motion, and the effect is very good in taking the trains up. It pulls as well as any brake I ever saw used.

1485 Q. 19. Do you remember a brake known as the Springfield brake, put on car 93 on the New Jersey Railroad a few months ago, having two chains winding around each windlass shaft?

A. I remember a brake was put on in our shop. It was applied in the way spoken of with two connecting rods on each truck and with two chains running to each windlass shaft.

Q. 20. Did you have anything to do with fitting up or adjusting the brake on that car?

A. I did. It came under my charge as assistant foreman of the shop.

Q. 21. Please state how nice a piece of work it was to adjust that brake when it was fitted up.

A. It was a particular job to get the chains running to the windlasses the correct length, so as to make them both act on both trucks at the same time.

Q. 22. About how much longer did it take to adjust the Springfield brake on that car than it does to adjust the centre lever brake when it is first applied to a car?

A. Well, I couldn't say exactly how long. It was one we never had anything to do with before. Probably it took half as long again to put that one on, it being something I never saw before.

Q. 23. Please state how much, if any, play is allowed in the cars of the New Jersey Railroad between the swing-beams and the inside cross-timbers between which the swing-beams hang.

A. Not anything at all. We fit them very tight, so that we often drive them in with a sledge.

Q. 24. If, by wear, there should come to be some play, what, if anything, do you do when the cars come in for repairs?

A. We always overhaul the trucks and fit the swing-beams, furr out the castings and make the swing-beams fit tight.

Q. 25. Suppose by use there comes to be some play when the
1486 cars are running on the road; what, if any, effect would this play
have on the operation of the centre lever brake?

A. It might make the chain running to the windlass a little longer when applying the brake; that is all.

Q. 26. Would it or not, in your judgment, make any difference in the effect of the centre lever brake upon the wheels?

A. I don't think it would. It would give as much power as if the swing-beam was tight, only you might have to wind a little more chain on the shaft.

Cross-examined:

Cr. 1. At what point of the centre lever, as used on the New Jersey cars, is the truck-lever connection made?

A. At the end of the centre-lever.

G. W. BROWN.

Sworn and subscribed before me this 28th day of October, 1872.

WILLIAM A. BLAIR,
Master in Chancery of New Jersey.

Deposition of Samuel Thomas, recalled by complainant, taken at Jersey City Oct. 28, 1872.

Direct examination by M'r Cozzens:

Q. 1. Please state what are your duties now on the New Jersey Railroad, at present leased by the Pennsylvania Railroad.

A. My duties are to see that the cars are in proper condition for the road. I am car-inspector. Have been car-inspector there about 14 years.

Q. 2. What does this seeing that the cars are in proper condition include, or require you to know?

1487 A. It includes all cars that come in the depot at Jersey City except the Washington air-line.

Q. 3. In keeping all these cars in good order, what part of the cars do you have to attend to?

A. Every thing about them.

Q. 4. Among these various cars under your charge what form of double-acting brakes are there on them?

A. There are centre levers, and some have two cross levers—one near each truck.

Q. 5. Please state what experience you have in seeing or knowing about the application and effect of the brakes on the cars when running into the station here in Jersey City, or when the cars are being "drilled."

A. I am right there with them all the time and see them coming in and going out. I see them when they are being "drilled."

Q. 6. Does this enable you to know how the brakes hold the cars when applied?

A. I can see when a brake is applied whether it is holding or not, when the car passes me.

Q. 7. How does the centre lever brake compare with the brake having two cross levers near the trucks as to the holding of the cars when applied?

A. The centre lever brake holds. I don't see but what it holds as well as the double lever, and it is a great deal less trouble to take care of.

Q. 8. You say "less trouble to take care of"; please state about how often on an average the centre lever brake has to be adjusted or have its slack taken up when a car is in use?

A. That depends on whether the nuts rattle off, but if the nuts remain on tight we have to tighten them up in from two to three weeks.

Q. 9. State what nuts you refer to as sometimes rattling off—where are they placed?

A. Nuts on the connecting rods connecting the two brakes in the truck.

1488 Q. 10. State whether these nuts are more liable to rattle off than on any other form of double-acting brake?

A. They are not; no, sir.

Q. 11. When you adjust or take up the slack of the centre lever brake every once in two or three weeks as you have stated, what do you do to it?

A. We screw up those nuts that I have just spoken of—on the connecting rods.

Q. 12. How long does it take to do this on an average?

A. If the nuts work easy, it don't take five minutes.

Q. 13. Taking one time with another, and one nut with another, how long does it take on an average?

A. It wouldn't take over ten minutes on an average.

Q. 14. Suppose you have a new brake-bar or new brake-shoes to put on, how does the time required to put them on compare as between the centre lever brake and the brake having the two cross levers?

A. I don't know as there is any difference in that.

Q. 15. Do you remember some months ago that a brake known as the

Springfield brake, having two chains winding on each windlass-shaft, was put on passenger-car number 93 of the New Jersey Railroad?

A. I recollect of a brake being put on of that kind with two chains, but I don't know the name of it, don't know what they called it.

Q. 16. Do you know how long that brake was continued in use on that car?

A. I don't think it was on very long.

Q. 17. While said brake was in use on that car, if the brakemen found fault with it to whom was it their duty to make complaint of it?

A. They complained to me; I was car-inspector.

1489 Q. 18. State whether, while this two-chain brake was in use on that car, the brakemen did complain to you about it?

A. Yes, sir; they complained.

Q. 19. What did they complain of in regard to it?

A. They complained of its working hard—wouldn't hold, and didn't hold the car.

Cross examination by M'r Whipple:

Cr. 1. In what month in the year 1872 did this two-chain brake first come under your observation as inspector of cars at Jersey City?

A. I couldn't say what month, but when it was turned out of the shop it came under my inspection.

Cr. 2. In what month do you think it was turned out of the shop?

A. Well, I think it must have been—I couldn't say what month—it must have been pretty well the fore part of the year.

Cr. 3. What month do you think is pretty well the fore part of the year?

A. In January or February; I think it must have been some where about then; I know it wasn't on a great while.

Cr. 4. While said brake was on said car 93, did you at any time take up the wear of the brake-shoes?

A. I didn't; but I think my men did. I am not positive; they often take these brakes up and I don't know it. I recollect that the brakemen complained of this brake, and I told them that if it wouldn't hold, I didn't know how to fix it to make it hold; I recollect that.

Cr. 5. Did the brakemen ever complain of other brakes not holding, that is to say the centre lever brake?

A. Yes, sir.

Cr. 6. Did you, while the double-chain brake was on car 93, give any personal attention to it by way of adjusting it and keeping it in order?

1490 A. I don't know that I did—any more than any of the rest of the cars; I don't recollect.

Cr. 7. Was said brake on car 93 some two or three months?

A. I don't think it was on three months.

Cr. 8. Why was the brake taken off, and where was it taken off, and for what purpose?

A. I think the brake was taken off at M'r Baker's shop, but am not positive. I think I understood that the brake was taken off because it worked hard—wouldn't hold.

Cr. 9. What brake was put on in its place—was it the centre lever brake or the double lever brake?

A. It was the centre lever brake that was put on, I think. I think it is on yet.

Cr. 10. Might it not have been the double-lever brake and the air brake applied to that?

A. I know the air brake is on the car, but I am not positive whether it is the double-lever or the single-lever brake.

Cr. 11. Then, was not the double-chain brake taken from car 93 that the Westinghouse air-brake might be applied to the same?

A. It seems to run in my mind that that car was taken to the shop that the double-chain brake might be taken off—and M'r Baker had the air-brake put on in its place.

Cr. 12. Do you know anything about the double-chain brake as used on car 93, other than what has beeen told you or reported to you by brakemen?

A. I do not; only by the brakemen and drillmen.

Cr. 13. Are not these brakemen and drillmen in the habit of reporting to you about other brakes not holding?

A. Yes, sir.

Redirect examination by M'r Cozzens:

1491 Q. 20. When they report to you about other brakes—for instance the centre lever brakes—not holding, what do you do to the brakes?

A. Sometimes we tighten up the connecting rods, and sometimes we put on new shoes.

Q. 21. Is this what comes under the head of adjusting—or taking up the slack of—the centre-lever brake?

A. Yes, sir; as a general thing.

Q. 22. Is there any difficulty in doing it with the centre-lever brake?

A. No, sir.

Q. 23. Why was it—when the brakemen complained to you that the two-chain brake on car 93 would not hold—that you told them that if it wouldn't hold, you didn't know how to make it hold?

A. The shoes were as close to the wheels as they ought to be, and if it wouldn't hold then, I didn't know how to fix it; the shoes were good.

Q. 24. When you said this, was there anything the matter with the adjustment of the brake?

A. I don't know that there was; if there was, I would have had it fixed. I didn't see anything the matter with the adjustment.

Q. 25. When the brakemen sometimes report to you that the centre-lever brake does not hold, and you have adjusted it in the manner stated by you a few answers above—what more, if anything, is there needed to make it hold?

A. I don't know that there is anything more particularly.

Q. 26. You have said that the two-chain brake was as you thought put on in the fore part of 1872—January or February. May it not have been put on in December or November, 1871?

A. I think since I spoke about its being on in 1872, that it was not on when M'r McDermond was here; he had charge of the general inspection for five months—he began to take charge the 11th of January, 1872. I never paid any attention to when that brake was 1492
put on, for I did not suppose that I would ever be interested in it. I don't recollect that it was on—I don't think it was at that time—whilst M'r McDermond had charge.

Recross-examination by M'r Whipple:

Cr. 14. How long did M'r McDermond have charge from the 11th of January?

A. Till the first of June.

Cr. 15. Was it after the first of June, 1872, that this two-chain brake was put on car 93?

A. I think not.

Cr. 16. When do you think it was put on?

A. I think, if I recollect right, it was put on in cold weather.

Cr. 17. Did this two-chain brake on 93 hold the car as a brake ought to hold, at any time after it came out of the shop?

A. Well, I don't know; I couldn't say.

Cr. 18. What do you think about it?

A. It might have held; all I know is they complained to me—the brakemen and drillmen.

Cr. 19. And this complaint comes to you about other brakes from the brakemen and drillmen?

A. Yes, sir.

Cr. 20. And do you mean by other brakes the centre-lever brake, and the double-lever brake?

A. Yes, sir.

Redirect examination by M'r Cozzens:

Q. 27. When any complaints come to you about the centre-lever and double-lever brakes, do you ever have any difficulty in adjusting them so that they will work well?

1493 A. I have made the centre lever work good, and I have made the double lever work what they call good. No, I don't have a great deal of trouble in making them work well generally. Sometimes they complain that they don't work well after I have fixed them, and then we generally tighten them up a little more on the nuts or slack up a little.

Q. 28. Do you apply the last part of this answer to both the centre-lever and double-lever brakes?

A. Yes, sir.

Q. 29. When the brakemen complained to you about the two-chain brake not holding—as you have stated—could you not, if it had needed it, have done to it all that you do to the centre-lever and double-lever brakes when the brakemen complain of them?

A. Of course we could—we could have put on new shoes, new irons, or tightened them up.

Q. 30. But were you ever able to adjust that brake and keep it up so that the brakeman would say that it worked well?

A. I don't recollect of ever hearing them say that it worked well.

Recross-examination by M'r Whipple:

Cr. 21. Did it ever appear to you that the same mode of adjustment applicable to the centre-lever brake and double-lever brake would throw the two-chain brake out of adjustment?

A. No, sir, it has not appeared to me.

Cr. 22. While the two-chain brake was on car 93, did any person or persons give you any instructions how to adjust said brake in order to make it hold as a brake ought to hold a car?

A. I don't recollect that any one ever did.

1494 Redirect examination by M'r Cozzens:

Q. 31. Did you ever do anything to the two-chain brake to try to throw it out of adjustment?

A. No, sir; I did not.

Q. 32. Did you do all you could to keep it in adjustment?

A. Just as much with that as with any of the rest of the cars; I did do all that I could to keep it in adjustment—I ordered it done.

Q. 33. Was it after all this that the complaints were made to you by the brakemen that it wouldn't hold ?

A. Yes, sir.

Q. 34. Please state how many trains come in and go out of the Jersey City depot—on the New Jersey Railroad—in a day, that are under your charge as car inspector of the Pennsylvania Railroad ?

A. They are all under my charge that run between here and Philadelphia except the Washington air-line. There are one hundred and twenty-three trains per day marked on the time-table.

Q. 35. How many men are under you ?

A. About sixty men—sixty or seventy.

Recross-examination by M'r Whipple:

Cr. 23. What did you do personally by way of adjusting the two-chain brake on car 93 ?

A. I don't recollect that I did anything myself; I ordered it to be taken care of—tightened up or slackened up—as I thought it required.

Cr. 24. Of the 123 trains that run out of the Jersey City depot per day, how many cars on an average compose said trains—should you judge ?

A. From five to ten; some of those same cars make a good many trips.

1495 Cr. 25. Of all these cars—be they more or less—how many have the centre-lever brake applied to them ?

A. I think, at present, most of the cars have the double-lever brake on.

SAMUEL THOMAS.

Sworn and subscribed before me this 28th day of Oct., A. D. 1872.

W'M A. BLAIR,
Master in Chancery of New Jersey.

1496 FURTHER TESTIMONY ON THE PART OF THE COMPLAINANT, TAKEN AT JERSEY CITY, N. J.

Deposition of Charles Watts, taken at Jersey City, Oct. 29, 1872.

Q. 1. What is your name, age, residence, and occupation ?

A. Charles Watts; age, twenty-seven years; residence, Rahway, New Jersey; I am a depot master at Jersey City, for the Pennsylvania Railroad.

Q. 2. How long have you been depot master for said road at Jersey City ?

A. Since the first of January, 1872.

Q. 3. After you became depot master on said road, January 1st, 1872, was there a brake having two chains attached to each windlass on a passenger-car belonging to the Pennsylvania Railroad Company, and running into the depot where you are depot master ?

A. There was, but I can't remember when it was put on, whether before I was appointed depot master or after.

Q. 4. Do you remember while that brake was on that car having an engine attached to the car; and if so, about when was it; and 14097 after the engine had been so attached, what, if anything, did you order done with the car ?

A. I remember the engine being attached to the car. I can't remember exactly when it was. I remember its being a very nice day. I think it was in April. After the engine was attached to the car I ordered the brake applied, and the ratchet set, and then ordered the car to be pulled from the straight track on to the curve and there stopped.

Q. 5. When the brake was applied to the car, what kind of a track was the car standing on?

A. On a straight track.

Q. 6. Was the car still or in motion when the brake was applied to it on the straight track?

A. Still.

Q. 7. How hard were the brakes applied at this time?

A. I can't tell that; if I had put it on myself I should have known it.

Q. 8. So far as you could judge, how hard were they applied?

A. The brake was put on ordinarily, the same as a brake usually is.

Q. 9. How near were you to the car at this time?

A. I should judge, about ten or twelve feet.

Q. 10. What pulled the car from the straight track on to the curve?

A. A shifting engine.

Q. 11. Before the car passed from the straight track on the curved track, had the brakes been applied?

A. The brake was applied and remained applied from the straight track on to the curve.

Q. 12. Was the brake applied then while the car was in motion and before the car struck the curve?

A. The brake was applied.

Q. 13. What was the effect upon the wheels of the car while
1498 the car was passing, with the brakes applied as you have stated,
from the straight track on to the curve?

A. The wheels of the front truck slid when they struck the curve; the wheels of the rear truck did not slide.

Q. 14. How far on tothe curve was the car drawn before it was stopped?

A. I think the car stood directly on the curve, so that both trucks were on the curve.

Q. 15. Is that double-chain brake still on that car?

A. No, sir; a Westinghouse brake has been attached to the car.

Q. 16. To your best recollection, about how long after the car was drawn on this curve, as you have stated, was this two-chain brake taken off?

A. I think about two or three weeks.

Q. 17. Please state how this curve on which that car was tried as you have described, compares as to sharpness—that is, shortness of radius—with curves on the main line of the New Jersey Railroad between Jersey City and Philadelphia?

(Question objected to, as it is assumed that the witness has no knowledge of the radius of curves on said road.)

A. I should judge it was about the same; if anything a little sharper.

(Answer objected to in absence of the proof.)

Q. 18. State whether, in your judgment, there are any of the curves on the main line of said road which are as sharp as this curve referred to?

A. I don't think there are.

Q. 19. How do the curves at turnouts on said road compare in sharpness with said curve?

A. From what I know of the turnouts I don't think they are quite as sharp.

1499 **October 30th, 1872.**

Q. 20. Was any other curve proposed for the trial of this car 93 than the curve on which you did order it tried, as stated? If so, please state what other curve was proposed, and why the car was not tried on such other curve.

A. It was proposed to try the car on the curve in the city of Newark, between the Centre-street bridge, over the Passaic River, and the Centre-street depot. We intended to send the car out on the two o'clock train, but on account of its being so late we could not do so without detaining the train, and for this reason the car was not tried on any other curve.

Q. 21. Who wished the car tried on this curve at Newark?

A. M'r Barker, the division superintendent, suggested the car being tried on the curve at Newark.

Q. 22. Who suggested trying the car on the curve on which it was tried?

A I did.

Q. 23. Was M'r Sayles present at this time; and, if so, did he say anything about these curves, and if he did what was it?

A. He was present. I don't positively know whether he said anything about the curve or not.

Q. 24. While this car with this double-chain brake on it was used on the New Jersey Railroad, what was the average number of cars with other brakes on them which were run in the same train with it?

A. From five to eight was about the average.

Cross-examination by M'r Whipple:

Cr. 1. When did you first make the acquaintance of M'r Sayles, the complainant in this case?

A. I can't tell exactly. I think some three or four weeks previous to the trial of the car, as near as I can recollect.

1500 Cr. 2. Please state the circumstances under which said acquaintance was made?

A. I was introduced to M'r Sayles by the division superintendent, M'r Barker, who, I think, informed me that M'r Sayles wished to have the brake on that particular car tried, or tried just as M'r Sayles should direct.

Cr. 3. Why was not the trial made at the time of your first acquaintance?

A. This car was at that time one of our extra passenger-cars, and was absent at the time, or not at Jersey City.

Cr. 4. How long thereafter before said trial was made?

A. As near as I can recollect, two or three weeks.

Cr. 5. Had there come to your knowledge that said brake was on a car of your road before being informed of the fact by M'r Sayles?

A. I did not know there was such a brake on the car until I was informed by M'r Sayles.

Cr. 6. Did there any complaint come to you from any quarter in reference to said brake before the trial of the same?

A. I do not think there did.

Cr. 7. Did there any complaint come to you after the trial and up to the time it was taken off?

A. I do not remember of any.

Cr. 8. Under whose instructions did you act in ordering out an engine in order to make a trial of said Springfield brake?

A. I did not receive any instructions to order out an engine.

Cr. 9. Did you receive instructions to make a trial of the brake with an engine?

A. No, sir; I received instructions to have the car put on a local train.

Cr. 10. From whom?

A. M'r Barker, division superintendent.

1501 Cr. 11. What was your authority for making a trial of said brake on a curve in the yard at Jersey City?

A. I took my own responsibility.

Cr. 12. At whose request did you take this responsibility?

A. No one's request. It was my own suggestion that the car be tried on that curve.

Cr. 13. Had you previously had any conversation with M'r Sayles in relation to alleged defects in said brake when tried on a curve?

A. Yes, sir; I did.

Cr. 14. What did he state to you in said conversation in reference to the operation of said brake on curves?

A. The import of his conversation was to the effect that the brake-chain would break, lever bend, or the truck jump the track.

Cr. 15. And was it this statement that led you to try the experiment?

A. No, sir.

Cr. 16. What then did lead you or influence you in your decision to try said brake on said curve?

A. An engine being already attached to the car, and a curve on the same track, I ordered the car pulled on the curve, not at M'r Sayles's suggestion, but, as I thought, to avoid the trouble of running the car at some other time.

Cr. 17. At which end of the car was the brake applied—the end nearest the curve, or at the end farthest from it?

A. At the end next the engine and nearest the curve.

Cr. 18. Did you notice, before submitting the brake to the trial aforesaid, whether the brakes were properly adjusted so that the brakes would bear equally, or nearly so, on both trucks when the brake was applied and run on a straight track?

1502 A. I made no examination of the brake whatever. I noticed the man apply the brake and set the ratchet.

Cr. 19. May not the turnbuckles in the long rods, one of which connected the brakes of the opposite truck from where the power was applied, have become loose, and the long connection elongated so that little or no power could be communicated to the truck farthest from the end where the brake was applied?

A. I know nothing about the construction of this brake, and, therefore, cannot say.

Cr. 20. Had there been but a single brake on the forward truck of this car next the engine, would the same result probably have followed on applying the brake on a straight track and then running it on a curve?

A. I cannot say positively. I think there is more probability of the wheels sliding on the track where it was tried than on the main line.

Cr. 21. Do you think that the fact that the rear truck of the car was connected with the forward windlass, would have anything to do with causing the wheels of the forward truck to slide when they struck the curve, the brakes of said forward truck being connected to the same windlass?

A. I cannot say.

Cr. 22. Having drawn the car through said curve with the brakes applied to the end nearest the engine, did you draw or back said car through said curve with the brakes applied at the opposite end to see if the wheels of the other truck would slide when they struck the curve?

A. The car stopped directly on the curve. I can't say whether the car went through or back. The brake was not applied on the other end of the car.

Cr. 23. Do you think, all things considered, that the brake had a fair trial at the time you hauled said car onto the curve and there stopped?

A. As to that, I cannot say.

1503 Cr. 24. Did you, or not, state to M'r Whipple in a conversation with him, that you did not think the brake had a fair trial, or language to this effect, referring to the trial aforesaid instigated and brought about by M'r Sayles?

(The wording of the last part of the question objected to by complainant.)

A. I do not remember of saying to M'r Whipple that the car had not a fair trial; but I think I mentioned to M'r Whipple that the wheels would be more likely to slide on the track where the trial was made.

Cr. 25. Some time after this trial, did M'r Barker direct you to have a brakeman try said car and test its holding qualities?

A. I do not remember.

Cr. 26. Did you not state thereafter that you had given directions to a brakeman to try said brake, and that he had not up to the time of inquiry by M'r Whipple made any report?

A. I do not remember of giving any such order.

Cr. 27. Did or not M'r Whipple come into M'r Barker's office two or three times after the aforesaid trial and request a trial of said brake to determine whether it would or would not hold a car as a brake ought to?

A. I have some slight recollection now of M'r Whipple making such a request.

Cr. 28. Was said request ever complied with, or any effort made on your part, or M'r Barker's, to comply with said request?

A. The request was not complied with, for the reason, as near as I can recollect, on account of the Westinghouse brake being attached to that car.

Cr. 29. Was not the Westinghouse brake applied to said car at least two or three weeks after said request was made?

1504 A. I think not.

Cr. 30. Are you positive that the Westinghouse brake was on car 93 when M'r Whipple made the request of M'r Barker to try the Springfield brake on said car?

A. Since our conversation here now about this matter, I am positive that the Westinghouse brake was not applied to said car at the time M'r Whipple made the request to M'r Barker to have the brake applied.

Redirect:

Q. 25. Did M'r Whipple call more than once about this matter?

A. He did call more than once; he called twice.

Q. 26. State whether the Westinghouse brake was on the car at each time of his calling?

A. The Westinghouse brake was attached at the last time of his calling only; not at the first.

Q. 27. Why, then, was the request which he made to have the brake tried not complied with at his first call?

A. I do not distinctly remember, but think it was on account of there being no train suitable for trying the brake without delaying important trains; there are only two or three trains on which we could conveniently try it.

Q. 28. Was there any objection or opposition that you know of to the trying of the brake?

A. Nothing more than that referred to in my last answer.

Q. 29. You have said, on your cross-examination, that you did not know that this two-chain brake was on car 93 until M'r Sayles told you of it. Was there any special reason why you should know it previous to his telling you?

A. I do not know of any.

Q. 30. Was it your business to know what brake was on car 93?

1505 A. No, sir; as long as the brake was in working order and not reported in bad condition.

Q. 31. Whose business was it to know what brake was on car 93 and to see that it was not in bad condition?

A. John McDermond; at that time our car inspector.

Q. 32. Who became general car inspector after John McDermond?

A. Samuel Thomas.

Q. 33. Is Samuel Thomas car-inspector at the present time?

A. He is.

Q. 34. Might the brakeman have complained about the working of this brake on car 93 without your knowing it?

A. Yes, sir; he might.

Q. 35. Did this car 93 run in any regular train while this two-chain brake was on it?

A. Not between the time that M'r Sayles called my attention to the fact that there was a double-chain brake on that car and the time the Westinghouse brake was attached.

Q. 36. During this time, in what train did the car run?

A. As an extra car, always on the rear of the train, or nearly so.

Q. 37. While running with this two-chain brake on it, was it every day at Jersey City; if not, state some of the lengths of time it would be away from there?

A. It was not at Jersey City every day. I can't form any idea of the lengths of time it would be away. It might be away a week and sometimes not more than an hour. Sometimes it would run to Newark and be cut off and put on the end of another train and brought right back.

1506 Q. 38. Why did you suggest for the trial of this brake the particular curve at Jersey City where it was tried rather than any other curve at Jersey City?

A. Because the car stood directly on that track. Also, I did not have the time to spare in trying it on any other curve.

Q. Did you suggest this curve because it was sharper than any other curve, or because it was not so sharp as any other curve at Jersey City?

A. I did not.

Q. 40. Was there any other reason whatever for suggesting this curve for the trial except that it was the most convenient curve that presented itself to you at the moment?

A. No, sir; there was no other reason, except, as I have already stated, that I did not have time to put it in a train to send it to Newark.

Q. 41. Did M'r Sayles express any wish as to what curve this brake should be tried on; if so, what did he say?

A. I do not remember of M'r Sayles making such a request.

Q. 42. Do you remember his expressing a wish to have the car sent to Newark to have the brake tried on a curve there?

A. Yes, sir; I think M'r Sayles was very anxious to have the car go there.

Q. 43. Did you go from your office in the depot to where car 93 was for any purpose; if so, for what purpose?

A. M'r Sayles and I left my office to go in search of the car, when I found it was too late to put the car on the 2 o'clock Newark train.

Q. 44. When M'r Sayles and you left your office to search for the car, what train did you intend to put the car into?

A. The two o'clock train for Newark and Perth Amboy. This car 93 was to be cut off at Newark—not being required to go any further on that train.

1507 Q. 45. In what direction, to the right or left, did this curve at Jersey City on which you tried this car, run?

A. To the right.

Q. 46. And in what direction did the curve at Newark, on which M'r Sayles was anxious to have the brake tried, run?

A. To the left.

Q. 47. At the time of the trial, when the brakeman on the car applied the brakes, did they or not appear to hold on both trucks on the straight track?

A. It seemed to me that, from the way the engine was laboring, the brakes were holding. You can tell from the exhaust of the engine whether the brake holds or not.

Q. 48. At any time before or during the trial, did you see M'r Sayles, or anybody else, do anything whatever to the rods of the brake?

A. I did not.

Q. 49. Was there anything in the nature or condition at this time of the curve or the rails on which the brake was tried why the wheels of one truck rather than of the other should slide on it?

A. I do not know of any.

Recross:

Cr. 31. By what name is the brake called in general use on the cars of the New Jersey road?

A. I don't know.

Cr. 32. Are they the centre-lever brake, so called.

A. I believe they are called the centre-lever brake.

Cr. 33. Did you ever know of the wheels of a centre-lever brake sliding on a curve?

A. I have known the wheels of both trucks slide with it on a curve.

Cr. 34. Did you ever know of the wheels of one truck sliding and not those of the other truck, when the cars are running on a curve under the brakes?

1508 A. Yes, sir; I have—on curves, on straight tracks, up grade and down grade, under all circumstances.

Redirect:

Q. 50. With what kind of brake attached to the centre-lever brake have you seen what you state in your last preceding answer?

A. The Westinghouse brake.

Q. 51. Have you seen the wheels slide with the Westinghouse brake applied to the brake on the Pennsylvania cars—that is to say, with the Hodge brake?

A. I have seen them slide. I know I have seen them slide on a straight track. I have seen them slide repeatedly coming in stations. It is a very common thing to see them slide.

Recross:

Cr. 35. Before the Westinghouse brake was ever applied to a car running into Jersey City, did you ever see the wheels of one truck slide on a curve, while the wheels of the other truck did not, the car having a centre-lever brake on it?

A. I have.

C. WATTS.

Taken, sworn to, and subscribed this 30th day of October, A. D. 1872, at Jersey City, in said district, before me.

ISAAC ROMAINE,
United States Com'r, District of New Jersey.

1509 *Deposition of David H. Baker, taken at Jersey City, Oct.* 30, 1872.

Q. 1. Are you the same David H. Baker who has been examined before in this case on the part of the complainant?

A. I am.

Q. 2. You are general foreman, I believe, of the car department at Jersey City of the New York division of the Pennsylvania Railroad?

A. I am.

Q. 3. Has there been within a few months past a brake called the Springfield brake tried upon a passenger car on the New Jersey Railroad—now called said New York division? If so, under whose direction was the fitting up of that brake done, and about when was it done?

A. There has. The fitting up of the brake was done under my direction, from instructions I received from M'r S. M. Whipple, now present. It was done before January, 1872.

Q. 4. Please state how well the putting of this brake on the car and the fitting it up was done.

A. I consider it was done in a workmanlike manner, and as well as it could be done.

Q. 5. When it was done, how nearly equally did the brake shoes bear on all the wheels of the car when the brake was applied?

A. They bore about equally, as near as I could judge, and as near as could be done.

Q. 6. In this Springfield brake, when it was on the car, what was the distance on the short chain and rod between the windlass shaft and the top of the truck lever into which said rod hooked?

A. About four feet.

Q. 7. What were the respective lengths of the long and short arms of the truck levers?

1510 A. I should judge it was about twenty seven or twenty eight inches from the top hole to the second hole, and about six and a half inches from the second hole to the bottom hole.

Q. 8. About what was the length between the windlasses of the car on which this brake was put and about what was the weight of the car?

A. About fifty-three feet from one windlass to the other. I can't give the weight of the car, only by estimation. I should estimate that it weighed between seventeen and eighteen tons.

Q. 9. Did you at any time see the Springfield brake on this passenger-car tried on a curve at Jersey City? If so, will you please state who was present at the time it was so tried?

A. I did. M'r Sayles, the complainant, Charles Watts, and several others were present when the brake was tried. I can't now recollect the names of the others.

Q. 10. Please state what was done with the car at this trial.

A. It was in motion when I saw it first, with the brakes applied, on a straight track, and a locomotive was drawing it on to a curve. When the first truck got fairly on the curve, the wheels began to slide in that truck. I don't know whether all the wheels slid; two of them did, any way. When it got fairly on the curve the car was stopped. M'r Sayles came around the car on the side where I was. I was from fifty to a hundred feet from the car. I saw M'r Sayles put his foot on the back brake-bar of the rear truck and move it; I saw it move. I saw them draw the car through the curve on to a straight piece of track beyond.

Q. 11. Were both trucks of the car on the curve when you saw M'r Sayles move the brake-bar of the rear truck with his foot?

A. I don't think the hind truck was altogether on the curve. It may have started on.

Q. 12. Please state what this fact—that M'r Sayles was able to
1511 move the brake-bar of the rear truck with his foot at this time—
indicated as to the brakes of that truck.

A. Indicated that there wasn't a great deal of pressure on it.

Q. 13. You say you saw the car drawn out through the curve on to the straight track beyond; when it reached the straight track beyond what was the effect on the brakes?

A. The wheels all turned then; there was no sliding then. The wheels only slid at one point in the curve.

Q. 14. How did the holding of the brakes when the car had been drawn through the curve on to the straight track beyond compare with their holding when you saw them applied on the straight track before the car had been drawn on to the curve at all?

A. I couldn't see that there was any difference at all. I left it after that.

Q. 15. When you saw this car with the brakes applied on the straight track, both before and after the car had been drawn through the curve, were the wheels of the car sliding or turning?

A. They were turning before and after they were drawn through the curve.

Q. 16. How many of them were turning, both before and after they were drawn on to the curve?

A. All of them—twelve wheels.

Q. 17. Please state what is your opinion as to the practical utility of a car-brake for regular use on railroads, which—when a car having the brake applied on a straight track is drawn on to a curve—would operate as you have described this Springfield brake to have operated in this trial.

A. I don't think, if I had the say, I would use a brake of that kind if I could get any others. I would not use a brake of that kind if I could get any others.

Q. 18. Is that Springfield brake running on the road now?
1512 A. Not to my knowledge.
Q. 19. Did you have anything to do with the taking it off?

A. I did not. I didn't know it was off until M'r Whipple told me it was off.

Q. 20. You have heretofore in this case testified that the Tanner or centre-lever brake has been for many years in general use on the cars of the New Jersey Railroad; please state when it first went into general use on said road.

A. If I recollect aright, I think it was in 1851 that it went into general use—1851 or 1852.

Q. 21. And have they been on that road ever since, and are they in use there at the present time?

A. They have been used ever since, and are in use there at the present time.

Q. 22. During this period how have they worked?

A. I believe they have worked satisfactorily. If they hadn't they wouldn't have kept them on to this time.

Q. 23. You say you believe they have worked satisfactorily; is there any doubt about it?

A. I know they have worked satisfactorily; there have been no complaints of them.

Q. 24. State how—in this long experience with the Tanner brake—you have found the brake to work when the cars with the brakes applied pass from a straight track on to a curve, and vice versa.

A. I have never seen any difference.

Q. 25. What is the effect of the Tanner brake as to the direction in which the trucks are drawn when the car is in motion and the brakes are applied?

A. I should say the effect would be to draw the trucks toward the centre of the car.

Q. 26. In the cars of the New Jersey Railroad, built and repaired under your charge, how much, if any, play is there between the sides of the swing-beams and the inside faces of the truck-timbers between which the swing-beams hang when you send the cars out of the shop? 1513

A. We don't mean there shall be any play—only enough to allow the swing-beams to move up and down.

Q. 27. How much will this "enough to allow the swing-beams to move up and down" amount to?

A. Less than an eighth of an inch.

Q. 28. After the cars have run some time without going into the shop, how much play do the swing-beams sometimes get from wear?

A. From three eighths to half an inch; we never allow them to get more than that.

Q. 29. When they get as much play as this, what do you do to them?

A. Furr out the wear-irons so as to make them tight again; what we call tight—nearly so.

Q. 30. In the practical use of the Tanner brake on the New Jersey Railroad, what, if any, difference is there in the pressure of the brake-shoes upon the two trucks when, in consequence of the car not having been repaired for some time, the swing-beams have got considerable play—say three-eighths or half an inch play?

A. I don't consider there would be any difference—providing the brake was properly adjusted.

Q. 31. Please state if the Westinghouse air brake is at the present time in use on the passenger-cars of the New Jersey Railroad; if so, how generally?

A. Most all the passenger cars on the road have them; there are very few exceptions. We are putting them on as fast as we can.

Q. 32. With what form of brake is the air brake applied on said New Jersey Railroad cars?

A. The Hodge and Tanner both.

Q. 33. How many of the cars of said New Jersey Railroad have the air-brake on with the Tanner brake?

1514 A. I can't tell the exact number; there are between forty and fifty; there may be more than fifty—or a few more than forty. We are putting the air-brake on with the Tanner brake as fast as we find a car that has not got one on.

Q. 34. How well does the Westinghouse brake work on these cars with the Tanner brake?

A. It works satisfactorily; there are no complaints.

Cross-examination by M'r Whipple:

Cr. 1. What proportion of the cars that come into Jersey City with the Westinghouse brake on has the application made through the Tanner brake?

A. I should think there was one-third.

Cr. 2. Through what brake is the application of the air-brake made to the remaining two-thirds?

A. Hodge brake, so far as I have seen.

Cr. 3. Did the order come from the Pennsylvania road to you at any time to change all the Tanner brakes to the Hodge in applying the Westinghouse air-brake?

A. It did; and I changed one, and then I got the order countermanded. They let me go on putting on the Westinghouse brake with the Tanner brake.

Cr. 4. In applying the Westinghouse brake to the cars of the Camden and Amboy Railroad, is the Tanner brake retained, or is the Hodge brake substituted?

A. On all the cars on which I put the Westinghouse brake the Tanner brake is retained. I have seen it applied with the Hodge brake.

Cr. 5. When the Westinghouse brake is applied to Camden and Amboy cars at Philadelphia or Bordentown, is the Tanner brake retained or discarded and the Hodge brake put in its place?

A. I believe that the Hodge brake is now put in its place.

1515 Cr. 6. From what point to what point does the so-called Jersey road run—formerly known as the New Jersey Railroad and Transportation Company, and what is the length of it?

A. It runs from Jersey City to some two or three miles beyond New Brunswick. I think its length is about thirty-four miles.

Cr. 7. On what car of the New Jersey road did you put the Springfield brake?

A. I think it was car number 93.

Cr. 8. Was that the number of the car that M'r Whipple obtained an order from M'r Jackson, superintendent, to apply the brake to; if not, what was the number of the car?

A. That was the car that I was authorized by M'r Jackson, superintendent, to put it on. M'r Whipple represented to M'r Jackson that there was a car, number 21, in the shop (a new car); but he did not represent to M'r Jackson that it was a new car. He (M'r Jackson) supposed, from the number, it was an old car. I explained to M'r Jackson the situation of the car. He told me to put it on just what car I saw fit, as that car (21) was finished, and they wanted to use it.

Cr. 9. Did M'r Whipple leave your shop, some time last December, with the expectation that you would apply the Springfield brake to car number 21, then in the shop; and did he expect that you would make the application that week, or the one following, or had you reason, from his conversation, to believe that he expected the brake would be applied as indicated in the fore part of the question?

(Objected to by counsel for complainant.)

A. I don't know what his expectations were, but I objected to his putting the brake on that car, as it was a new car and I did not wish to alter the brakes.

1516 Cr. 10. Did not M'r Whipple thereafter obtain from M'r Jackson, the superintendent, an order, notwithstanding your objections, to put said brake on car number 21?

A. I do not recollect whether it was an order or a communication from M'r Jackson. I do not know how it read. I think he brought me a letter from M'r Jackson.

Cr. 11. Did not that communication authorize you to put said brake on car 21?

A. I don't recollect exactly how that communication read at this time.

Cr. 12. Did you put said brake on at the time M'r Whipple expected you would have it ready for his inspection and approval on his return to Jersey City from Washington?

A. I don't know what his expectations were. I put it on. A few days after he called, and found it wasn't on the car he expected it was on. I inquired at the hotel where he, or somebody else, told me he was staying. They told me he hadn't been there in a day or two.

Cr. 13. Did M'r Whipple exercise any personal supervision over the application and trial of said brake to car 93, as applied by yourself?

A. He wasn't there personally when I put it on, and he found no fault with it afterwards, when he saw it was on; not to me.

Cr. 14. In applying said brake to car number 93, did you put turnbuckles in the long rods?

A. I did.

Cr. 15. And check-nuts on said rods back of the turnbuckles?

A. I did; according to his instructions.

Cr. 16. When said brake was taken out for trial on the track, under the direction of M'r Sayles, the complainant in this case, was the brake applied by the windlass at the end of the car nearest the curve on to which it was drawn by the engine or at the opposite end?

(Question objected to as stating an error in asserting that M'r Sayles directed this trial.)

1517 A. The man stood on the end of the car nearest the curve on to which it was drawn, with the brake-wheel in his hand. I suppose he was applying the brake from that end. There was nobody on the other end.

Cr. 17. Is there any doubt but that the brake was applied from the end at which the man stood?

A. Not in my mind there isn't.

Cr. 18. Do you know that M'r Sayles, or some other person, did not lengthen the long rod, by means of said turnbuckles, before this trial was entered upon, so that the rear truck would have little or no pressure upon it when the brake was applied, while the forward truck would have its brake applied through its connection almost to the sliding point?

A. I did not see any one do it, nor did I examine it to see if it was done.

Cr. 19. Had such been the case, as the question seems to indicate, would the brakes of the rear truck have little or no power on them, while the forward truck would have the brakes thoroughly applied?

A. It would have that tendency.

Cr. 20. Was M'r Whipple present at this trial spoken of in your direct examination of the Springfield brake on the straight track and the curve?

A. I did not see him there.

Cr. 21. What is the radius of the curve on which this trial of the Springfield brake was made?

A. I don't know anything about it.

Cr. 22. Are all the tracks in the yard at Jersey City more or less covered with grease from the drippings of cars and engines standing on them?

A. At times they are.

Cr. 23. Do you think it is a proper place to try the qualities of any brake?

A. I don't see why it shouldn't be. If one truck would slide, the other would slide, so far as the grease on the track is concerned.

1518 Cr. 24. Do you think that the aforesaid trial of the Springfield brake was in all respects a fair one?

A. If I had been opposed to the brake, I should have wanted to have been there myself. I had nothing to do with the trial. I accidentally saw it. I did not see enough of the trial to judge if it was a fair one, nor did I take interest enough in it to judge.

Redirect:

Q. 35. What kind of a car was this car, number 93, on which you put the Springfield brake?

A. It was considered one of our first-class passenger-cars.

Q. 36. Was there any reason whatever why a Springfield brake on car number 93 should not work in all respects the same, and as well, as if put on the new car, number 21?

A. Not any. It would have worked as well on one car as on the other.

Q. 37. State how closely you followed M'r Whipple's instructions to you about how to put the brake on when you put it on car 93.

A. As near as I could do. I believe, exact, almost, in every respect.

Q. 38. How nearly of the same dimensions and weight are cars 93 and 21?

A. They are pretty nearly alike. I should judge car 93 is two feet longer than car 21, and they are about the same width and weight.

Q. 39. Please state what was your opinion as to how the Springfield brake would work when applied on a car on a straight track, and then made to pass, with the brake applied, from the straight track on to a curve, before you saw the trial you have testified about.

A. It was always my opinion that it wouldn't brake equal on the trucks.

1519 Q. 40. In what respects, if any, did the working of the brake when you saw it on this trial differ from your previous opinion about it?

A. It corresponded just with my opinion.

Recross:

Cr. 25. How much service had the wheels of car 93 performed at the time the Springfield brake was applied to it—as near as you can judge?

A. I can't tell anything about how much work they had done. The wheels were in good order or we would have taken them out.

Cr. 26. Were the wheels new at the time said brake was applied?

A. They were not; some of them may have been new.

Cr. 27. Were the wheels new on car 21 as it stood in the shop last December?

A. They were.

Cr. 28. Had you applied said Springfield brake to said car 21—having first weighed the iron of which the shoes were composed, and then weighed the iron of the shoes of another car with the Tanner brake applied—said car of the same weight, with new wheels, and had the two cars been coupled together and run in a regular train until the shoes were worn out on both cars, and the remaining iron of the shoes been weighed on each car, and it had been found that the Springfield brake had worn out the same number of pounds of iron that the Tanner brake had under the same circumstances—would you or not have come to the conclusion that so far as the stopping of either of the cars was concerned the Springfield brake was as good for this purpose as the Tanner brake?

A. I don't know as I have any theory about that. That is too much of a mixed up question for me to answer. If one brake will slide
1520 the wheels and another won't, of course the one that slides the wheels won't wear the blocks as much as the other—but one man may brake more on one car than he does on another.

Cr. 29. Assume that one brakeman is to operate the brakes on the two cars as fitted up in the foregoing question, and run together till the shoes are worn out on each car, and it is found by actual weighing that the shoes so worn out have consumed as much metal as the others—other conditions being the same to both brakes—would or not in your judgment one brake be as efficient as the other in holding a car?

A. No; I should think not. In the first place, you may so arrange a brake that all the wear may come on one truck going one way—braking from one end—and going the other way and braking from the other end all the wear come on the other truck, and wear just as much metal as the brake on the other car that operates uniformly on all the wheels, and may show a wear of the same amount of metal at the end—if there is a possibility for two cars to use up the same amount of metal, which I don't think there is, even with two cars with the same brake on.

Cr. 30. Is or not the efficiency of any brake measured by the amount of metal consumed in the use?

A. I never heard of any such measurement; that is a new measurement to me.

Cr. 31. Is it possible to stop a railroad car by the means of brakes in which iron to iron is used and not consume metal; under that, I mean metal in the brake-shoes?

A. If you apply the brakes until the wheels slide, the brake-shoes will not wear.

Cr. 32. Assume that the wheels do not slide in the application of the brake, and then what is your answer?

A. It is impossible to do it. If two pieces of iron wear together they wear off.

1521 Cr. 33. Which brake in your judgment is doing the most efficient service in stopping a car—a brake that consumes half an ounce of metal in the stopping, or one that consumes three-quarters of an ounce in stopping; assuming that the wheels do not slide in either case?

A. That is a thing I don't want to decide on and won't decide on. I have never seen it tested.

D. H. BAKER.

Taken, sworn to, and subscribed this 29th day of October, A. D. 1872, at Jersey City, in the district of New Jersey, before me.

ISAAC ROMAINE,
United States Com'r, District of New Jersey.

1522 FURTHER TESTIMONY ON THE PART OF THE COMPLAINANT TAKEN AT JERSEY CITY, N. J.

Deposition of S. B. Stull, taken at Jersey City, Nov. 8, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. S. B. Stull; I am twenty-eight years old; I reside in New York City; I am a brakeman on the Pennsylvania Railroad.

Q. 2. How long have you been brakeman and on what trains?

A. I have been brakeman about two years on that road, part of the time between Jersey City and New Brunswick, and a part of the time between Jersey City and Philadelphia. I have been brakeman on the Philadelphia line about one year and three months.

Q. 3. What kind of brakes are used on the cars where you have been brakeman during the last two years?

A. Well, different kinds. There are three different kinds of 1523 brakes. The New Jersey cars have one kind which have a centre lever; the Pennsylvania cars have no cross levers; the Philadelphia, Wilmington and Baltimore, and Baltimore and Ohio cars have a brake with two upright levers in each truck, and long rods connecting the brakes between the trucks. Some of the New Jersey cars and the Pennsylvania cars now have the air-brake attached.

Q. 4. Which of these three brakes you speak of do you prefer?

A. I think I prefer the brake in the New Jersey cars.

Q. 5. Please state why you prefer these brakes.

A. The reason I prefer this brake is, because we do not have so much winding on the windlass to get the brakes to take hold, and the springs on the brake-beams are not so stiff as those on the Pennsylvania cars, and I think they hold them just as well, if not better. On the Philadelphia, Wilmington and Baltimore cars there is too much chain to wind up, so that it overlaps itself and destroys the power of the brake.

Q. 6. Does, or not, what you have stated in reference to these different brakes apply to these three different kinds of cars, before the air-brake was attached?

A. It does.

Q. 7. You say the air-brake has been applied to the New Jersey cars and the Pennsylvania cars; which of the two brakes, the centre-lever brake on the New Jersey cars, or the two cross-lever brakes on the Pennsylvania cars when the air-brake is attached, work the easiest by hand?

A. The New Jersey cars.

Q. 8. Have you often noticed these cars with the three different kinds of brakes attached being stopped at stations?

A. I have.

Q. 9. Have you or not noticed the wheels sliding when the train 1524 was being stopped at stations with the different kinds of brakes applied? If so, please state fully what you have noticed.

A. I have seen one pair of wheels slide and none of the rest. I have often seen the four wheels of one truck slide and none of the rest. I have seen the four wheels of each truck slide—this applies to each of the three kinds of brakes attached to the cars. I think there is no difference in sliding; one is as liable to slide as the other.

(Cross-examination waived.)

S. B. STULL.

Sworn and subscribed before me this 8th day of November, A. D. 1871.

W'M A. BLAIR,
Master in Chancery, of New Jersey.

1525 TESTIMONY ON THE PART OF THE COMPLAINANT, TAKEN AT WILLIAMSBURGH, NEW YORK.

Deposition of Henry H. Farnum, j'r, taken at Williamsburgh, Nov. , 1872.

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. The name you have, Henry H. Farnum, j'r; age, 28; residence, Port Jervis, N. Y.; my occupation, chief engineer of South Side Railroad of Long Island, and have been chief engineer there for about three years.

Q. 2. Please state, if you know, the radius of the curve on the main track of the South Side Railroad of Long Island, at the Bushwick station, nearest to the depot building.

A. The curve is irregular and the average radius is five hundred and seventy-three feet (573).

Q. 3. What is the radius of that part of the curve nearest the depot?

A. The curve is shorter at that end, and I should think it was about five hundred feet (500).

1526 Q. 4. Please state the radius of the first curve west of Richmond Hill, on the South Side Railroad of Long Island.

A. Twenty-eight hundred and sixty-five feet (2,865).

Q. 5. What is the radius of the curve at Jamaica station on said road?

A. Six hundred and fifty feet (650).

Q. 6. What is the radius of the respective curves at the Y, at Valley Stream, on said road?

A. The radius of the curve on the west arm of the Y, which is the curve towards or nearest Bushwick, is seven hundred and thirty feet (730); and the radius of the curve on the east arm of the Y, which is the curve farthest from Bushwick, is five hundred and twenty-one feet (521).

Q. 7. Please state whether all these curves which you have testified about are in the main line of the road and are run over by the passenger trains of said road?

A. They are, with the exception of the two on the Y, which are a part of the Far Rockaway Branch of the road, over which passenger-trains are run throughout the year by the South Side Railroad Company.

Cross-examination by M'r Whipple:

Cr. 1. What are your means of knowing that the radii of the several curves to which you have testified in your direct examination are correct?

A. The road has been surveyed throughout its entire length—and its branches as well—entirely under my direction, and these statements of the radii are taken from the surveys and maps.

Redirect:

1527 Q. 8. Going from Bushwick how many of these curves that you have testified about turn in the same direction?

A. They all curve the same way; that is, to the right, going from Bushwick east.

H. H. FARNUM, J'R.

Deposition of William H. Weightman, taken at Williamsburgh, Nov. 26, 1872

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. William H. Weightman; age, 27; residence, Jersey City, N. J.; place of business, New York City; occupation, draughtsman.

Q. 2. How long have you been draughtsman, and what has been the nature of your draughting?

A. Since the summer of 1863; and in machinery of all kinds, more especially steam machinery; from 1863 to 1869 serving in the Novelty Works, New York, both in the shop and in the drawing-room, partly as apprentice, and partly as regular workman in both departments. Have also been engaged as draughtsman in the machinery department of the United States revenue and coast survey services.

Q. 3. Were you present at the trial of certain brakes on a car on the South Side Railroad of Long Island a few days ago?

A. I was, on different days, between 14th and 23d (inclusive) of November, 1872.

Q. 4. Please explain what kind of a car it was, and what kind of brakes you saw tried on said car.

A. The car was what was called a first-class passenger car on the road, marked as "Ladies' Car No. 33." The brakes that were
1528 attached to the car were the brake called the "Springfield brake,"
and the brake called the "Tanner brake."

Q. 5. State whether you yourself measured the different parts of these brakes, and also many of the different dimensions of the said car.

A. I did.

Q. 6. What was the length of that car between the bumpers?

A. Fifty-three feet.

Q. 7. Please state, if you know, the distance between the journals in the trucks in that car.

A. Six feet between centres.

Q. 8. You say you saw what is called the "Springfield brake" tried on that car. Please state, if you can, the length of the rods and chains, and also the lengths of the truck levers and their proportions in what was called the "Springfield brake."

A. I measured these lengths and found that the longer connection measured 37 feet 7 inches, with 20½ inches of chain at one end and 21½ inches of chain at the other end of the car. The shorter connections measured 3 feet 7 inches, with 19½ inches of chain at one end of the car and 20½ inches of chain at the other end of the car. The levers measured, at the longer end, 26⅛ inches, while the shorter end measured 5⅞ inches, making a total of 32 inches length between extreme centres. There were two levers to each truck. There were two long rods and chains—one running from each windlass to the opposite truck, and two short connections—one running from each windlass to the lever of the nearest truck. In each of the long rods there was a turnbuckle placed for the purpose of adjustment. The windlass shaft was 1½ inch in diameter; the windlass wheel was 16 inches in diameter.

Q. 9. Did you see the "Springfield brake" adjusted after it was attached to said car? If so, please state how it was done.

1529 A. I did see it adjusted. The windlass was wound up and the brake put on, previously having put one-quarter inch strips of iron between the shoes and the wheels for the purpose of feeling the pressure of the shoe, by inserting a bar in the opening. When the pressure was not equal in both trucks the turnbuckles in the longer rods were screwed up or slackened till the adjustment was equal and the pressure was exact on the wheels of both trucks. I did the final adjusting myself, and saw that the pressure was equal on the wheels of both trucks. The pressure of the shoes on one pair of wheels of each truck was a little less than on the other pair of the same truck.

Q. 10. After the brake was thus adjusted what was done with said car?

A. The car was drawn out upon a straight track by an engine; the brakes were applied at one end of the car; it was then backed onto a curve and the pressure of the shoes upon the wheels tested.

Q. 11. Please state what the effect of the brake was upon the wheels; first on the straight track where it was tried, and also when run upon the curve.

A. On trying the pressure of the shoes upon the wheels, on the straight track, it was found to be the same on both trucks. On the car being stopped the wheels slid on both trucks; I mean, one pair of wheels on each truck slid. The car was then backed on a curve, with the brakes on the same as when stopped, and all the wheels on one truck slid, while those on the other truck ran comparatively loose. Those wheels on the truck nearest the windlass, from which the power was applied, slid, while those farthest from the windlass ran loose. The car was then backed upon a straight track—the brakes applied on this straight track at the opposite end of the car—and drawn onto the curve. It was then found that the wheels nearest the applied windlass were loose, and those furthest from the applied windlass were
1530 tight. One pair of wheels on the tight truck slid. The curve on which this was tried was the one nearest the Bushwick depot buildings, on the main track of the road.

Q. 12. What was then done with the said car?

A. The car was then backed into the shed and the trial postponed, because it was train time.

Q. 13. What was next done with the car with the Springfield brake on?

A. On the next trial the car was drawn out by the locomotive onto a straight track, the brakes readjusted so that the shoes bore equally on both trucks. I looked to the adjustment myself. We then started off on the road, stopping at a place called Richmond Hill, where there is a curve which runs to the right in reference to the direction in which the car was going. The brakes were here applied, on the straight track, before stopping, and upon examination we found that the pressure was greatest on the truck nearest the windlass where the brake was applied, and was quite loose on the farther truck. The car was then started ahead and backed down again, with the brakes applied on the straight track at the opposite end of the car, with the same result, viz: that the brakes on one truck were tight, and on the other truck were loose, although not quite so prominent as at the Bushwick depot, this being a much larger curve. The car was then drawn on the road to

Jamaica, the brakes applied at the usual stopping-place at that station and upon watching the wheels, those on the truck nearest the applied windlass slid, while those on the truck at the further end of the car ran quite free. This was on a pretty sharp curve. The car was then drawn ahead ahd backed down, the brakes being applied from the other end of the car, with the same result as before. We then went on to Valley Stream, where there are two curves forming a "Y." The brakes were applied, and the car drawn forward and backed, with the same
1531 result as at Jamaica, on both of these curves. In all instances where the curve ran the same way, whether the brakes were applied at one or the other end of the car, the wheels of the same truck slid. We then returned on the road to Bushwick, where we tried the brakes applied on a straight track and found that they were considerably out of adjustment, whether applied at one or the other end of the car.

Q. 14. What was next done with the brakes on said car?

A. These brakes were taken off.

Q. 15. What brake was then put on the car?

A. The "Tanner brake," so called.

Q. 16. How were the levers of the Tanner brake arranged on the car?

A. Two of the same truck levers were used on this as had been used on the Springfield brake. The same windlass wheel and shaft were used as in the other. The truck levers were placed in the end of the truck nearest the end of the car and lay at the same angle as in the Springfield brake. The centre lever measured four feet between outer centres and two feet six inches between inner centres—the inner centres being nine inches inside of the outer ones. The windlass rods connected with the outer centres of the centre lever and the truck levers connected with the inner centres of the same.

Q. 17. What was then done with said car?

A. The car was drawn out on the straight track, the brakes adjusted by screwing upon a nut on the connecting-rods between the brake-bars of the trucks. The car was then run on the straight track and the brakes applied, and all the wheels of both trucks slid. The car was then run on to the same curve above mentioned, viz, the one nearest the Bushwick depot building—the brakes being still on and all the wheels sliding as before when on the straight track. The car was then backed
1532 down and run on to the curve the reverse way, with the brakes applied from the other end of the car while on the straight track, when all the wheels on both trucks again slid—both on straight and curved track. The brake-levers of the trucks were then removed and arranged on the inside ends of the trucks between the brake-beams and the king-bolts, as seen in the drawings of the Tanner patent—the tops of the levers being connected as before with the centre lever.

Q. 18. After the levers were so arranged what was then done and what was the result?

A. The brake was first tried on the straight track and found to be properly adjusted, the locomotive then attached, and the brakes applied on the straight track and drawn on the curve—the same curve above mentioned, viz, the one nearest the Bushwick depot building—all the wheels sliding on both straight and curved track. We then drew the car off on to a straight track and backed down, applied the brakes at the opposite end of the car on the straight track, when all the wheels of both trucks again slid on both straight track and curve.

Q. 19. What was then done with the car?

A. It being then train time, the car was drawn off and returned to the shed.

Q. 20. What was next done with the car ?

A. On the next day but one after, the car was drawn out on a straight track—the locomotive being attached—the brakes tried, and found to be properly adjusted, when we started off on the road to Richmond Hill, where the brake was tried on the curve before mentioned and found to slide all the wheels, when the brake was applied at either end of the car. We then went to Jamaica, and applied the brake on the same curve that we had applied the Springfield brake, and we found that all the wheels slid when the brakes were applied. We then went on to Valley Stream, and tried the brakes on both curves of the "Y"—and 1533 from each end of the car—when we found that all the wheels slid in all the trials. We then returned to Bushwick, stopping on the way at a long stretch of straight track, where the brakes were applied at both ends successively with the same result as before, all the wheels sliding. On arriving at Bushwick, the brakes were applied at both ends alternately and found to be still in proper adjustment. The car was then returned to the shed.

Q. 21. Did you see the Hodge brake tried on the same straight track and curve near the Bushwick station as the other two brakes were tried on ?

A. Yes ; I did.

Q. 22. What was the result ?

A. The break was applied to car No. 12 on same road—a passenger-car. The brakes were applied on the straight track and run on to a curve, when two wheels of each truck slid on both stright track and curve. The car was then run on to a straight track and the brakes applied from the other end with the same result, two wheels from each truck sliding.

Cross-examination by M'r Whipple:

Cr. 1. In the application of turnbuckles to the Sringfield brake, were there check-nuts on the rods contiguous to said buckles for the purpose of making them permanent and fixed ?

A. There were not.

Cr. 2. After the first trial of said Springfield brake, as testified to by you, the car was taken into the shed and afterwards was taken out again, and you say the break was readjusted. Why was it necessary to readjust it if it was properly adjusted at the time of said first trial ?

A. Because on trying the pressure of the shoes on the wheels of both trucks, it was found to be unequal.

1534 Cr. 3. How do you account for this inequality after so short a trial, seeing that all the parts of the brake were iron to iron ?

A. I can only account for it from the difference in the length of the rods through which the brake levers are operated and the extra strain on the chains while running over curves, that the brake is easily put out of adjustment.

Cr. 4. May there not be a remedy for this inequality by giving the long rod an advantage over the short one in adjusting the brake, that is to say, making the long rod more taut than the shorter one, which can easily be done with the turnbuckles ?

A. There may not, for the reason that when you make the longer rod more taut than the short one you make the pressure of the shoes on the wheels unequal, and proper adjustment demands that the pressure on the wheels of both trucks shall be equal.

Cr. 5. Please state whether the same brakeman applied the brakes in all these trials, both of the Springfield and Tanner brakes?

A. The same man applied the brakes in all parts of the trials at Bushwick. At other times regular road brakemen were employed.

Cr. 6. What instructions, if any, were given to the brakemen before entering upon these trials?

A. There were no instructions given, to my knowledge.

Cr. 7. In testifying to the operation of the Springfield brake on the curve, you say that the brake on one truck was tight while the brakes on the other truck were loose; do you mean by "loose" that there was little or no power on the wheels of the truck?

A. They were so loose that they exerted very little, if any, influence on the stoppage of the car.

Cr. 8. How much influence did the brakes exert on the stoppage of the car on the truck of the same car in which the brakes were tight while the brakes were loose on the other truck?

1535 A. So little influence that the momentum of the car carried the wheels sliding along the track.

Cr. 9. When you came to operate the Tanner brake on the same car, the influence was enough to slide the wheels of both trucks; was this so?

A. It was.

Redirect:

Q. 23. Please state whether you yourself turned the turn-buckles you have spoken of; and, if you did, state whether they turned hard or easy, and whether any check-nuts were needed to keep the turn-buckles permanently in place after being moved.

A. I did. They turned quite hard, requiring a stick of two feet length to turn them easily. The thread was newly cut also. Check-nuts were not needed to keep the turn-buckles in place, in my judgment, during the period of the trial.

Q. 24. In the trials, to which you have referred, with the Tanner brake, when the first sliding of any of the wheels took place, how many wheels in each truck slid?

A. The two wheels nearest the outer end of the car on each truck in all cases slid first.

Q. 25. Please state which of the two—the Springfield or the Tanner brake—required the longest time to adjust the brake-shoes properly to the wheels.

A. The Springfield brakes considerably longer.

Recross:

Cr. 10. Did you at any time inspect the turn-buckles in the long rods of the Springfield brake, so that you can testify that by continued jarring of said rods, they were not elongated for want of a check-nut back of each turn buckle?

1536 A. Before starting at any time with the Springfield brake, I examined the adjustment. On the route I looked to see that nothing had got out of order at the different stopping-places, and on the return I could see no symptoms that the longer rods had been lengthened or shortened by the turning of the turn-buckles.

Cr. 11. Did you put a mark on the screw, and on the turn-buckle, so that you could at any time determine whether the long rods had been lengthened by the continued jarring of the same?

A. I did not, as I could not have told by that means, from the fact that, had the turn-buckles turned exactly once, twice, or three times, the marks would have been in the same position with reference to each other.

Cr. 12. Had you made a mark with a file across the two arms of the turn-buckle at the end of the screw projecting within the turn-buckle, and had the turn-buckle turned round by continued jarring, would not the screw have receded from that mark more or less?

Q. It would.

Cr. 13. Do you know it did not recede, consequent upon the jarring or some other cause?

A. I know it did not recede enough to, in my opinion, affect the brakes.

Cr. 14. Do you know it did not recede at all?

A. I do not.

Redirect:

Q. 26. Upon what do you found your opinion that it did not recede enough to affect the brakes?

A. Upon the fact that it took at least one quarter inch in the movement of the turn-buckles to affect the brakes in adjusting them; so it should take at least that much movement to put them out of adjustment, and I should at least have noticed a movement of one-quarter of an inch in the turn-buckles.

1537 Recross:

Cr. 15. Do you know of your own knowledge that the turn-buckles did not, from jarring or other causes, recede at least a quarter of an inch, and thereby elongate the rods to that extent?

A. I know and am satisfied that they did not.

W. H. WEIGHTMAN.

Deposition of A. P. Doane, taken at Williamsburgh, Nov. 27, 1872.

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. Name is A. P. Doane; age, 47; residence, Brooklyn; occupation, master-mechanic of South Side Railroad of Long Island.

Q. 2. How long have you been master-mechanic of that road?

A. Four years.

Q. 3. Were you ever engaged on any other railroad before coming to the South Side road; if so, what other road, in what capacity, and how long?

A. I have been. I was on the Oswego and Syracuse, Long Island, New York Central, and New York and Erie Railroads. I was master-mechanic of the Oswego and Syracuse road about four years, and two years on the Long Island road. I was foreman and draughtsman of the New York Central, at Syracuse, for fifteen years.

Q. 4. Please state whether you were present between the 14th and 23d days of November, 1872, at certain trials of brakes on the aforesaid South Side Railroad?

1538 A. I was.

Q. 5. What kind of brakes were the chief subjects of these trials?

A. The Springfield and Tanner brakes.

Q. 6. Please state what kind of a car it was upon which these brakes that were tried were put.

A. A first-class passenger-car, No. 33.

Q. 7. Will you please state what was the condition of the railroad track at the times of these trials?

A. The track was dry.

Q. 8. Please state what was done with the car in trying these brakes, speaking first of the Springfield brake trial.

A. The brake was put on and an engine connected with the car and run out upon the straight track. The brake was adjusted, and applied upon the straight track on the eastern end of the car; that is, the end farthest from Bushwick. Then we ran on to the curve in the Bushwick yard nearest the depot buildings, the car running to the west. On the curve one set of the brakes were found to be tight, and the other comparatively loose.

We then run the car upon the straight track again and applied the brake to the other end of the car. We ran on to the same curve again with the same results; that is to say, the brakes were tight on the same truck as before and loose on the same truck as before. When the brakes were applied on the straight track the brakes were tight on both trucks, a pair of wheels on each truck being slid when the brake was thus applied on the straight track; but when the car was run on to the curve the wheels of the truck at the east end of the car slid—both pairs of wheels—while the wheels were revolving upon the other truck. The car was then put in the house because it was train-time.

The next time we had a trial, we hitched an engine on to the car and drew it out of the house on to a straight track, and then adjusted 1539 the brakes. What I mean by "adjusting" is to create an equal pressure upon each truck. The brake was then applied upon a straight track, and the same trials as just described by me were repeated upon the same straight track and same curve as I have just mentioned, and with the same results; that is to say, with the brakes tight to sliding a pair of *of* wheels to each truck, when on the straight track, and with the brakes, when on the curve, tight and sliding all the wheels of one truck, while all the brakes were comparatively loose upon the other truck.

We then ran out on the main line of the road about four miles to Richmond Hill. We applied the brake on the east end of the car on the straight track and run the car on to the curve. The result was that on the curve the brakes on the eastern end of the car were tight; I cannot say whether the wheels were sliding or not; on the west truck the brakes were comparatively loose, that is, looser than the other ones.

We then let the brakes off and ran to Jamaica, and there applied the brake at the eastern end of the car. We ran on to the curve at Jamaica station and stopped with the brakes set. We examined and found the brakes tight on the eastern truck, and comparatively loose on the western truck.

We then let the brake off and ran out to Valley Stream, which is distant about thirteen miles from Bushwick on the main line of the road, and at which point the junction of the Rockaway Branch with the main line is made. We then set the brake upon the eastern end of the car upon the straight track and ran the car upon the curve on the western arm of the Y. We then stopped on the curve and examined the brakes. Those upon the truck nearest the windlass where the power was applied were tight, and those on the other truck were comparatively loose.

We then let the brake off and applied it on the straight track 1540 before entering upon the eastern arm of the Y and upon the same end of the car as before, and then ran on to the eastern arm of the Y. We again examined the brakes on this curve and found them tight on the end nearest the windlass where the power was applied, while the other truck was comparatively loose.

We then let the brake off and ran on to the straight track and applied the brake on the straight track, at the other end of the car, and ran on to the eastern arm of the Y again, and stopped on the curve and examined the brakes and found the brakes comparatively loose on the truck nearest the windlass where the power was applied, and comparatively loose on the other truck.

We then let the brakes off and ran on to the straight track on the main line and returned to Jamaica. We applied the brake on the straight track at the westward end of the car and ran on to the curve at Jamaica Station. We stopped on the curve and examined the brakes and found the brake comparatively loose upon the westward truck and tight upon the eastern truck.

We then let off the brake and ran to Bushwick. We then applied the brake and stopped in Bushwick yard on a straight track. We examined the brakes and found that they were out of adjustment. We then let the brake off of that end of the car and applied it at the other end of the car, and then examined the brakes and found that they were out of adjustment from that end of the car also.

We then let the brake off and put the car in the house.

Q. 9. Please state what trials were made with the car with the Tanner brake.

A. We put the Tanner brake on the car and adjusted it, and then attached an engine and ran out upon the straight track and applied the brake upon the straight track; the result was that we slid the 1541 two outer pair of wheels of both trucks, and we then let the brake off; we then started up and applied it again at the western end of the car, and ran the car on to the same curve at Bushwick that I have spoken of before, and slid all the wheels of both trucks; we then let the brake off and ran east a short distance on to a straight track, and then we started west again and applied the brake at the westward end of the car on the straight track and ran on to the same curve I have spoken of in Bushwick yard, sliding the two outer pair of wheels in each truck. We made two trials of this kind from each way, sliding all the wheels on one trial, running west, both on straight track and curve, and the outer pair of each truck running west, on the second trial, on both straight track and curve. We made the same trial running eastward, sliding all the wheels on both trucks both on straight track and curve, the brake being applied at the other end of the car. We then put the car into the house because it was late and train time. The next day of the trial with the Tanner brake we attached an engine to the car and made similar trials to those just mentioned on the straight track and curve at the Bushwick depot. We slid all the wheels of the car both on the straight track and curve.

We then started off on the road and applied the brake at the same curves, namely, Richmond Hill, Jamaica Station, and the two arms of the Y at Valley Stream, as we did at the trials of the Springfield brake above detailed by me, and made the same trials at these curves as we did with the Springfield brake. On examining the brakes at these different curves, we found the pressure of the brakes was the same on both trucks. But at the Y there was a platform which enabled us to stand and see the effect of the pressure of the brakes on the wheels of the car when it was in motion. I got out and stood on that platform and saw the car go by on these curves on the Y, and saw that all the wheels were sliding in both trucks under the application of the brakes. On returning we stopped at Jamaica, and I got out on the platform there. The car was backed down on to the straight track and the brake applied upon the straight track and run on to the curve at Jamaica Station, and we slid all the wheels of both trucks both on straight track and curve. We then run about four miles towards Bushwick from Jamaica, and stopped on a straight track. I got off the car, and the car was then backed towards Jamaica. We then run west and applied the brake and slid all the wheels of both trucks on this straight track. We let the brake off and run west a short distance, and then run east again, applying the brake from the other end of the car, sliding all the wheels on the straight track. We then let the brake off and run to Bushwick, and when we got there we applied the brake while in motion on the straight track and stopped on the straight track. I got off the car and examined the brake and found it having the same pressure on both trucks. We then ran the car into the house. 1542

Q. 10. You have stated both in regard to the Springfield brake trials and the Tanner brake trials that you examined the brakes to test their pressure upon the wheels. State whether you did this yourself; and, if so, in what way you did it?

A. I did it myself with a wooden lever six feet long, about four inches wide, and one inch and a quarter thick. The lever was applied between the brake hanger and the wheel as low down as I could get the lever in.

Q. 11. You have stated, in reference to the trials which you made with the Springfield brake, that in all the cases in which the car, with the brake applied on the straight track, passed from the straight track on to the curves and was stopped there the shoes on one truck were tight and on the other truck were comparatively loose; please state how efficient the braking was in these cases upon the truck in which the shoes were comparatively loose. 1543

A. It was very inefficient, exerting very little influence over the stopping of the car.

Q. 12. In your judgment as a railroad man state what would be the utility for continued practical use upon a railroad of a car-brake which operates as you have herein described this Springfield brake to operate.

A. I should not think it would be practicable.

Q. 13. Is there or not a difficulty in the Springfield brake in reference to its keeping up its adjustment after being originally properly adjusted?

A. There is.

Q. 14. State whether you yourself noticed the time and attention bestowed upon the adjustment of the Springfield brake on car 33 previous to the car being started out on any of the trials you have described.

A. I noticed they were taking more than ordinary pains with it.

Q. 15. When the adjustment of this Springfield brake on said car was completed for these trials previous to the starting out on the trials, how perfect was the adjustment?

A. It was as perfect as it could be done.

Q. 16. About how much of the time in the practical use of car-brakes upon railroads are they adjusted so as to be in an equally perfect condition of adjustment with said Springfield brake, as the latter was previous to starting out on these trials?

A. It is not once in a hundred times that they adjust a brake in that way.

Q. 17. What would be the effect, in reference to the economical management of a railroad, of bestowing upon the Springfield brake such attention and such length of time as you consider would be necessary to keep up its adjustment in such a manner as would be required with it if all the cars of a railroad which now have double-acting brakes were equipped with Springfield brakes? 1544

A. I think it would be very disastrous.

Q. 18. Would it or not require more men to do this adjusting than are required with the double-acting brakes at present in use?

A. It would require more men.

Q. 19. How practicable, in your judgment, would it be to keep up upon all the double-brake cars of a railroad such a condition of adjustment of the Springfield brake as would fit it to run?

A. I don't think it would be practicable.

Q. 20. State whether you observed the turn-buckles which were used upon the long rods of the Springfield brake on car 33 referred to in this deposition; and, if you did, please state whether they turned hard or easy, and whether check-nuts were needed to keep them permanently in position during the running of the car.

A. I noticed persons turning them, and saw they used a lever 2½ feet long. I thought from their motion the buckles worked hard. I should not think they required a check-nut.

Q. 21. Were these trials with the brakes which you have detailed, made under your supervision?

A. I permitted them to have the brakes put on, and I supervised the trials.

Cross-examination by M'r Whipple:

Cr. 1. I wish to repeat the twelfth direct interrogatory, substituting Tanner brake for Springfield brake; it will then read as follows: "In your judgment as a railroad man, state what would be the utility for continued practical use upon a railroad of a car-brake which operates as you have described the Tanner brake to operate."

A. It would be good.

1545 Cr. 2. Please state the names of the persons present at the aforesaid trials of both the Springfield and Tanner brakes.

A. A. P. Doane, W. Homan, F. B. Chichester, M'r S. D. Cozzens, Thomas Sayles, W'm H. Weightman. These were all present at the trial of the Springfield brake. At the trial of the Tanner brake, M'r A. P. Doane, M'r S. D. Cozzens, M'r Thomas Sayles, and W. H. Weightman were present; M'r Homan also saw the trial in the yard with the Tanner brake.

Cr. 3. Who is M'r Homan, and who is M'r F. B. Chichester?

A. M'r Homan is superintendent of the road; M'r Chichester, assistant superintendent of the road—the South Side Railroad of Long Island.

Cr. 4. From whom did you receive orders to prepare for and try these experiments in brakes?

A. M'r F. B. Carman, managing agent of the road. He gave me permission to do so, if in my judgment I thought I could do so without interfering with the business of the road.

Cr. 5. Did either the president or superintendent give any permission or direction in regard to this matter?

A. No.

Cr. 6. Who first at any time called your attention to the Springfield brake?

A. M'r Sayles.

Cr. 7. What did M'r Sayles wish of you?

A. He wished to try an experiment, and brought a letter from M'r Carman, general managing agent, as already stated.

Cr. 8. To what expense has the company been to in preparing for and carrying out these trials in brakes?

A. About two hundred dollars.

A. P. DOANE.

Sworn and subscribed before me this 27th day of November, 1872.

J. H. S. DOLMAGE,
Commissioner of Deeds.

1546 *Deposition of Walter Homan, taken at Williamsburgh, Dec. 5,* 1872.

Direct examination by M'r Cozzens:

Q. 1. What is your name, age, residence, and occupation?

A. Walter Homan; my age is fifty-three; Bayport, L. I.; my occupation is superintendent of the South Side Railroad of Long Island.

Q. 2. How long have you been superintendent of that road?

A. Since the 1st September, 1872.

Q. 3. How long have you been connected with that road, and in what capacity previous to being superintendent?

A. Since April 1, 1872. I was assistant superintendent under M'r Douglass, the superintendent, and have been connected with the road since the first tie was laid, about five years ago. Previous to April 1st, 1872, I had charge of building the depots, freight-houses, platforms, engine-houses, tank-houses, and of everything connected with the road except the roadbed, and have had entire charge of the roadbed since April 1st, 1872.

Q. 4. Were you present on the 20th day of November, 1872, at a trial of a car-brake called the "Springfield brake" on passenger-car 33 on the South Side Railroad?

A. I suppose the date is correct, though I did not take the date down, but I was present at the trial of the brake.

Q. 5. Please state in what condition were the roadbed and the rails of the South Side Railroad between the points where the trial took place on the road on the day you were present.

A. In good condition—better than what might be called "good condition." The trial was made on the best part of our road, where 1547 there is a double track. We consider where the double track is the best part of our road, the track at this part being a continuous heavy rail and fish-joints.

Q. 6. Please state whether you observed the manner in which the brake operated upon the wheels of the car at the time of this trial on the curve in the main line in the railroad yard nearest the depot building and on the curves in the main line near Richmond Hill, and at Jamaica and on the two arms of the Y at Valley Stream; and, if yea, please state what was the comparative pressure of the brake-shoes on the wheels of the two trucks when the car with the brake properly applied on the straight track passed on to these curves and was stopped on the curves?

A. I noticed it. The brake applied harder to one truck than it did to the other. When the brake was applied then on testing the brake-shoes by a lever they were found to be very tight on one truck and not so tight on the other truck. The wheels slid on the forward truck, but the wheels of the hind truck did not slide. We then reversed the application of the brake, that is, applied the brake from the other end of the car, and repeated the trial, and the same wheels that slid before, and the same wheels were not so tight on this repeated trial that were not so tight before. I mean to say that with this reversed application of the brake the result was the same as before.

Q. 7. At these trials did any person after the car was stopped try the brake-shoes with a lever; and, if so, who, and did you see the lever applied?

A. Yes; M'r A. P. Doane, the master mechanic. I saw the lever applied.

Q. 8. Would or not, in your judgment as superintendent of a railroad, a car-brake which operates as you saw the Springfield brake operate on
these trials to which you have testified be a practical brake for
1548 continued and regular use upon all the double brake cars of a
railroad?

A. It is not considered a good brake that will slide the wheels of one truck while the wheels of the other truck turn.

Q. 9. As superintendent of a railroad, would you or not, want to use a brake which operates as you saw this Springfield brake operate on said trials?

A. No, sir; I should rather not.

Cross-examination by M'r Whipple:

Cr. 1. Would you or not consider a brake a good one that would slide all the wheels of both trucks of a car?

A. No, sir; I should not consider it a good brake. I should rather have one that would not slide any of the wheels. I would rather have a brake that would apply the power to all eight of the wheels equally, without sliding. A brake may be a good brake and apply power enough to slide all the wheels of the car, but I would rather not have any of the wheels slide.

Cr. 2. Would you consider the Springfield brake a good brake if leverage enough is given to it whereby all the wheels of the car could be slid?

A. Not from the test which I saw of it.

Redirect:

Q. 10. Please state over again what you just now added to your last cross-answer, but which was not taken down?

A. I don't know what you have reference to.

Q. 11. I refer to what you said about the Springfield brake not applying the power equally to the two trucks.

A. It appears to me that I have answered that question.

1549 Q. 12. You did answer it, but the answer was not fully taken down. Please repeat all that you said in answer to the last cross-question.

A. I said that the power might be applied to those trucks so that the wheels of one truck would be sliding while the wheels of the other truck were in motion. I said that perhaps the power might be applied that would slide all the wheels, but not from an ordinary hand-brake, such as we use, I think.

Q. 13. Which brake would you consider was applying the power the most nearly equally to the two trucks of a car, a brake which would slide all the wheels of the car, or one which would slide the wheels of one truck while the wheels of the other truck revolved?

A. That which when applied would slide all of the wheels.

Q. 14. You said in your second cross-answer that a brake may be a good brake and yet slide all the wheels of a car, and you also said that you would rather have a brake that would not slide any of the wheels. Please state more fully how it is that a brake may be a good brake though it may slide all the wheels?

A. A brake to be a good brake, in my opinion, should have the power equally on all the wheels. You may put power enough on a good brake to slide all the wheels, but we don't consider in railroading that it is a good thing to slide wheels. The sliding makes "flat" wheels.

Q. 15. Is it or not a good way to show to a person—who is standing or walking beside a car upon which the brake is applied—how nearly equally the brake-shoes are pressing upon the wheels of the two trucks to apply the brake with power sufficient to slide all the wheels of the car?

A. I do not know of any other practical way; it is the only way that I have seen brakes tested. I would say that at a test at which I
1550 was present some year and one-half ago on the Flushing road—
which was a test of the "Stenard" steam brake—that that was the way that we tried the effect of the brake—by standing on the side of the track and seeing the train go by and watching the effect of the brakes.

WALTER HOMAN.

Sworn before me this 5th day of December, 1872.

J. H. S. DOLMAGE,
Commissioner of Deeds.

Deposition of Adam Kraft, taken at Williamsburgh, Dec. 5, 1872.

Q. 1. What is your name, age, residence, and occupation?

A. Adam Kraft. My age is twenty-two. I reside in Williamsburgh, N. Y., and by occupation a switchman on the Southside Railroad—in the yard at Bushwick station.

Q. 2. How long have you been on that railroad, and how long have you been switchman?

A. I have been on this road about one year and nine months. Have been switchman about four months.

Q. 3. Before you were switchman on said road what did you do there?

A. I was night watchman on that road at Bushwick depot.

Q. 4. Are you experienced in using brakes on cars, and how long have you been so?

A. I am. Have been about five months using brakes.

Q. 5. Do your duties now require you constantly to apply the brakes upon the cars running about the depot yard?

A. Yes, sir.

1551 Q. 6. Do you remember last month—November, 1872—that a brake called the Springfield brake was tried upon passenger car No. 33 of the Southside Railroad, in the yard at Bushwick, and did you pply this brake on this car?

A. I do remember, and I applied the brake on the car.

Q. 7. Do you remember a trial with this Springfield brake when the brake was applied on the straight track in the yard? And, if so, state who applied the brake at this time, and what was the effect of the brake upon the wheels of the car.

A. Yes, sir; I applied the brake at this time. When going along the straight track one pair of wheels in each truck slid, and the others did not.

Q. 8. In trying the Springfield brake, did you or not set the brake with the ratchet in the usual way when the brake was applied on the sraight track?

A. I set the brake as hard as I could, and set up the ratchet.

Q. 9. When the brake was applied on the car on the straight track and the ratchet set up as you have stated, where was the car then run and what was the effect of the brake upon the wheels of the car?

A. It was run on to the curve nearest the depot building at Bushwick. Two pair of the wheels on one truck slid and the wheels of the other truck did not.

Q. 10. Do you remember, a few days after this trial of the Springfield brake, that a brake called the Tanner brake, having a horizontal lever under the centre of the car, was tried on the same straight track in the Bushwick yard? And if you do, please state who applied the brake.

A. Yes, I applied the brake.

Q. 11. How hard did you apply the brake, and did you set up the ratchet after you had applied it?

A. As hard as it laid in my power. I set up the ratchet.

1552 Q. 12. What was the effect of this Tanner brake upon the wheels of the car after you had thus applied it on the straight track?

A. I think they worked first rate.

Q. 13. How was it as to sliding the wheels of the car on the straight track?

A. It slid all the wheels on the straight track.

Q. 14. When this Tanner brake was applied on the straight track and the ratchet set as you have stated, where was the car then run and what was the effect on the wheels?

A. It was run on to the same curve in the yard, nearest the depot building. The wheels slid on the straight track. On the curve I could not say; I was on the car.

Q. 15. Please state whether you have ever noticed the effect of the Hodge brake, which is in regular use on the passenger cars of the Southside road, as to sliding the wheels of the cars when the trains are coming into this depot at Bushwick; and, if so, state what you have noticed.

A. I have noticed, when some of these trains came into Bushwick, that all the wheels of a car were sliding when the brakes have been set up to stop the train.

Q. 16. State whether you have noticed this often or not very often.

A. Not very often.

Q. 17. On what part of the track at Bushwick have you noticed this with the Hodge brake?

A. Very nearly the middle of the yard, just striking the curve.

Q. 18. State whether you have also noticed this same effect with the Hodge brake on the same straight track and curve, nearest the Bushwick depot building, on which you saw the Springfield and Tanner brakes tried.

A. Yes, sir; I have seen the same effect.

1553 Q. 19. When you tried the Tanner brake in the Bushwick yard, how did you find that it stopped the car as compared with the Hodge brake, which is regularly used on the road?

A. I think that both of them brakes work just alike. I don't think there is any difference as to stopping the car.

Q. 20. In your daily work in the Bushwick yard do you often have to apply the Hodge brake on the cars?

A. Yes; every day.

Q. 21. Which brake, the Tanner or the Hodge, has the most slack chain to be wound up when the brake is being applied?

A. The Hodge.

his
ADAM + KRAFT.
mark.

Deposition of A. P. Doane, recalled for complainant, taken at Williamsburgh, Dec. 5, 1872.

Direct examination by M'r Cozzens:

Q. 1. When, in your judgment, is a car brake doing the most effective braking?

A. Just before the wheels slide.

Q. 2. What is the best test to the eye of a person standing or walking by the side of a car upon which a brake is applied as to whether the power of the brake is being applied equally or nearly equally to both the trucks of the car?

A. To see the wheels slide would be as good a way as any.

Q. 3. Unless the complicated and expensive test of a dynamometer be applied to the brakes, what other practical way than making the wheels slide do you know of for determining the equality of the pressure on the two trucks?

1554 A. I know of no other way except the use of the dynamometer.

Q. 4. At the trials of the Springfield and Tanner brakes to which you testified on the 27th of November, 1872, did you give any directions to the brakemen as to how they should apply the two brakes; if so, what were your directions?

A. I ordered them to set the brakes tight enough to slide the wheels, if possible. These directions applied equally to the Springfield and Tanner brakes.

Q. 5. Please state whether a car brake may be a good brake and yet be capable of applying sufficient power to slide all the wheels of a car, and please give your reason for your answer.

A. It may be a good brake, because you are sure you can reach the point just before sliding, and that point is considered desirable by railroad men.

Q. 6. Suppose a brake is found to be capable of exerting sufficient power to slide all the wheels of both trucks of a car, and suppose that it is not considered desirable to permit the wheels to be slid when it can be avoided, what would you do to such a brake?

A. I would reduce the leverage.

Q. 7. As the Tanner brake was arranged on car 33 at the time of the above-mentioned trials described by you, what, if any, difficulty would there be in preventing the brake from sliding the wheels without affecting its comparative equality of power upon the two trucks?

A. There would be no difficulty. You would have to reduce the leverage.

Q. 8. Suppose a brake operates as you, on November 27, 1872, described that the Springfield brake operated at the trials made with it, namely, the brake shoes of one truck being tight and of the other truck being comparatively loose when the car with the brake applied on a straight track passed on to the curves you spoke of, how, if at all, could
1555 you reach, or know that you had reached, the point which you say is most desirable in a brake—that is, the point where the

brake is applied to all the wheels hard enough to be just short of sliding them all?

A. Under such circumstances, you could not tell.

Q. 9. Please state whether, in your railroad experience, you have ever observed the effect as to the speed at which a train of cars moves when many of the wheels in the train are sliding, as compared with its speed when the brakes are applied short of the point of sliding; and, if yea, please state on what railroad you have seen it, what kind of cars it was, what kind of track the cars were moving on, and what the effect as to the comparative speed was.

A. I have seen trains under that condition on the railroad between Troy and Schenectady; the cars were moving on a good track, on a T rail; it was snowing; the rails were wet. I have seen that when the brakes were applied to the cars short of the point of sliding the train seemed to go slower than it did after the wheels of some of the cars came to sliding under the application of the brakes. The cars were house freight cars, and had single-acting brakes. There were about 23 cars on the train, I think, and three brakemen on the train besides the conductor, making four men in all. This train was on a heavy down grade; the train got the best of us, and we all put on the brakes as hard as we could. I was engineer on the train, and reversed the engine and failed to hold the train.

Q. 10. Will you please state whether you have ever noticed the driving-wheels of an engine slipping or sliding on the track when steam is on the engine; and, if so, what is the usual course adopted by engineers under such circumstances?

A. I have seen engines slip on the track. The usual course is to give them sand on the track, and if they continue to slip, to reverse the engine and then throw them back and let the wheels get a new hold.

1556 Q. 11. Please state whether you have ever seen the effect of the Hodge brake upon the wheels of the cars on the South Side Railroad when trains were coming in over the straight track and curves at the Bushwick depot; and, if so, please state what, if anything, you have sometimes noticed as to the sliding of the wheels at such times.

A. I have seen the cars with the Hodge brake come over the straight track and curve inquired about with the wheels sliding; at some times I have seen all the wheels of a car sliding; and sometimes not all of them; and sometimes not any of them; very seldom all of them; but I have seen them all slide a number of times under a car with the Hodge brake.

A. P. DOANE.

Sworn before me this 5th day of December, 1872,

J. H. S. DOLMAGE,
Commissioner of Deeds.

1557 JOHN CHARTS, a witness produced on behalf of the complainant, testified as follows:

Q. 1. What is your name, age, residence, and occupation?

A. My name is John Charts; I am 45 years of age; I reside in New York City, and am baggage-master on the New York and New Haven Railroad.

Q. 2. How long have you been baggage-master on said railroad?

A. About ten or twelve years.

Q. 3. Were you ever employed in any capacity upon the New York and Boston night express line, which ran over the New York and New Haven road in the years 1856 and 1857; if so, in what capacity?

A. Yes, sir; I was first brakeman on that night express.

Q. 4. For about how long a time did you act as brakeman on that train?

A. Some time in 1852 I commenced, and continued to be brakeman until I got to be baggage-master.

Q. 5. While running as brakeman, on that train, in 1856 or 1857, or thereabouts, do you remember a peculiar kind of car-break', different from the regular brake used on the New York and New Haven cars, being on the cars of said train?

A. Yes, sir.

Q. 6. Will you please state whether said brake worked well or not?

1558 A. No, sir; it did not work well.

Q. 7. What was the matter with it; how did it answer in holding the cars?

A. It wouldn't hold the cars; the blocks didn't seem to press against the wheels.

Q. 8. While you were running on that train, during the time said brake was used, do you remember any accident which happened to the train; if so, will you please state the circumstances of it?

A. Yes, sir. Coming on to New York one night from New Haven, we were nearing Stamford station, a freight-train broke in two; the signal lights and torpedoes were placed on the track to notify us, a long distance back; that night it was foggy, and the track was wet and slippery; I had the hind brake, on which was a Hodge's brake, about the time the engineer blew the alarm, and the conductor, M'r Baush, stood inside the door, and saw that I had the brake applied; the first I knew we run into three freight-cars, and we came to a stop.

Q. 9. Did you on this occasion make any effort to stop your train from running into those freight-cars by applying any of the other brakes on the train?

A. I did not. I know all the other brakes were on, as I went and looked, and found the other brakes set, after we stopped.

Q. 10. At the time these said brakes, other than the Hodge brake, were used on this night express train, at what place or places was the depot of the New York and New Haven Railroad in New York City?

A. At the corner of Canal street and Broadway.

Q. 11. After the engine was uncoupled from the train, on reaching New York, as well as when the train was started from the depot in New York, to be drawn to the engine, did you have anything to do with braking on the cars in going through the city?

1559 A. Yes, sir; more coming into the city than going out.

Q. 12. In going through the city with these brakes which have been inquired about, did you have any difficulty in holding the cars? If so, please state the nature of such difficulty.

A. Yes, sir; coming through the city to Canal street. The drivers would cut loose the horses so as not to have them run over, and I would take hold of the brake and put it on, and the car would run until we came up to some grade and stop. The driver would then hitch on again and start the car.

Q. 13. Was there or not much effect produced on the car as to holding it when you put on these brakes at these times as you have stated?

A. There didn't seem to be any on the down grades. The brakes wouldn't seem to hold any on the down grades.

Q. 14. During the time that these brakes inquired about were used on this train, was there any cars with any other kind of brake on run in the train; if so, where were such other cars put on and what kind of brakes did they have?

A. Yes; out of New York we would have three or four cars. They had the Hodge brake on. Coming from New Haven there would be one car behind—one of the New Haven cars, or sometimes one of the New Haven, Hartford, and Springfield cars.

Q. 15. Why was this one car put on to the train at New Haven?

A. To hold the train. We could not hold the train with the other brakes—the Springfield brakes. Up grade we could stop with them, going up hill.

Cross-examined by S. M. Whipple:

X Q. 16. How long were these Springfield brakes in use on the cars of this night express line?

1560 A. I couldn't tell exactly, sir.

X Q. 17. How long, according to your best recollection?

A. I think about two or three years.

X Q. 18. What brakes were in use on the cars of the night express line before and after the Springfield brake was applied and used?

A. I think the Hodge's brake.

X Q. 19. When the Hodge's brake were used on the cars of the night express line, was it customary to take on additional cars at New York to accommodate the passengers to New Haven?

A. Yes, sir.

X Q. 20. Were these cars taken off at New Haven or were they run through to Boston?

A. They might take off a car if they didn't want to use it for passengers; but if on arriving at New Haven they wanted to use the car for passengers it went on to Springfield.

X Q. 21. When the night express train arrived at New Haven for New York, has it not for a number of years been the custom to take on one or more cars at New Haven to accommodate passengers from that place to New York?

A. No, sir; that train is very light when it gets to New Haven. There has been sometimes, in case of an excursion or something of that sort, we take on some cars; but as a general thing now and always, with the exception of the time we used the Springfield brake, we leave a car or more at New Haven from that train.

X Q. 22. Did you ever leave a car from that train at New Haven when the Springfield brake was used on it?

A. Yes, sir; sometimes if two of the Hodge's brakes come on behind we would leave one.

X Q. 23. Did there ever come within your knowledge an accident on the New York and New Haven road of any kind when the Hodge brake was used?

1561 A. Yes, sir; some time at Mamaroneck we run over a horse, and it threw the trucks of the next to the last car from the track.

X Q. 24. Any other accidents within your knowledge?

A. We run over a broken rail the 29th of September, 1855.

X Q. 25. Any other?

A. No, sir; I don't remember any.

X Q. 26. On what kind of a rail does any brake hold best—a dry rail, wet rail, or frosty rail?

A. A dry rail.

X Q. 27. How much sooner in your judgment can you stop a train on a dry rail than on a wet rail or a frosty rail?

A. I couldn't answer that very correctly, but I should think a little over half way.

Redirect:

Q. 28. Under the circumstances of the accident at Stamford with the Springfield brakes, and notwithstanding the condition of the rails as you have described it, ought the train to have been stopped in time to prevent the accident if the Hodge brake had been on those cars of the train which had the Springfield brake on?

A. Yes, sir.

Q. 29. In the case of these accidents you have referred, when you ran over a broken rail and also over a horse, did the brakes have anything to do with them?

A. No, sir.

Recross:

X Q. 30. Had the Springfield brakes been in good order on that train at the time of the accident at Stamford, ought the train to have run into those detached freight cars?

1562 A. I think they were as good as ever I knew them. They were examined at New Haven and examined at Bridgeport. I knew them to be in good order that night. There were no chains broke—no nothing. The brakes were all set when I examined them.

X Q. 31. Ought the train to have run into the detached cars as you have stated had the Springfield brakes been in good order?

A. I can't tell about the order of those brakes.

X Q. 32. What brakes was in use on the cars of the Springfield, Hartford and New Haven road at the time the Springfield brake was in use on the cars of this night express line? Were they the Hodge brake or some other double brake?

A. I think it was the Tanner brake.

X Q. 33. From your experience in operating both brakes, what preference have you, if any?

A. The Hodge brake.

X Q. 34. How much better in your judgment is the Hodge brake than the Tanner brake?

A. Well, I prefer the Hodge brake for my use on a train, though the Tanner brake is a good brake.

X Q. 35. Why do you prefer the Hodge brake to the Tanner brake?

A. In the first place I have used it more, and I don't know anything else.

X Q. 36. Were you to equip the cars of a road with brakes, which would you select were it left with you to determine?

A. That would be something in this way: if they were both the same price I would take the Hodge. Both are good.

X Q. 37. Why would you take the Hodge?

A. I think it is a better brake.

X Q. 38. What brake is now in use on the passenger cars of the New Haven, Hartford and Springfield road?

1563 A. On our road, I think the Hodge brake.

X Q. 39. Were it put upon you to stop a train in the quickest possible time by means of hand-brakes, which brake would you choose for this purpose, the Hodge or Tanner?

A. The Hodge.

X Q. 40. Why choose the Hodge?

A. Because I am more used to it, and I think it is the best brake.

X Q. 41. Were it put upon you to stop a train in the quickest possible time, and you were given brakemen who had operated other than the Hodge and Tanner brakes, and well understood applying brakes, which brake would you choose?

A. I might choose the Hodge brake.

X Q. 42. You will please give your reason for such choice.

A. I think it is the best brake.

X Q. 43. Do you mean by that it is the best brake for any one to operate?

A. It would be the best for me. I believe it would be the best for any one.

X Q. 44. Why would it be the best brake for any one?

A. Because I think it is the best in use, at least the best I have ever used. There may be other brakes that I don't know anything about.

X Q. 45. Why is the Hodge brake the best brake you have ever used?

A. Because I think it binds on the wheels more and better than any other.

Redirect:

Q. 46. You said in your recross answer, speaking of the Spring-
1564 field brakes at the time of the Stamford accident: "I can't tell about the order of those brakes." Please explain more fully what you mean by this?

A. Because, in the first place, if they were out of order I couldn't go to work and put them on. I couldn't make them any better than they were on that occasion. The brakes would not hold the train. I never knew them to; what I mean is if the brakes were not in order on that occasion I couldn't make them any better.

Q. 47. You said in your 17th cross answer that you thought the Springfield brakes were on that train two or three years. May it not be that they were on only about a year or so?

(Objected to as seeming to instruct the witness.)

A. I think it was about two or three years.

Q. 48. Have you any special circumstances to fix the length of time by?

A. No, sir. We used them running into Canal street and also 27th street depot.

Q. 49. Are you a mechanic, and do you understand constructing and adjusting of brakes to obtain the greatest service from them?

A. No, sir. All I know is if I take hold of a brake whether it's in good working order.

Q. 50. During the time the Springfield brake was used, do you know of an instance when that brake was in working order?

A. I never found it to be when I used it.

Q. 51. Had the old single brake been applied to all the cars of that train at the time of the Stamford accident, with the help of the Hodge brake on one car, could the train have been stopped in time to prevent the accident, the number of brakemen being the same in both cases?

A. I have never used the single brake on that road.

1565 Q. 52. It being understood that the single brake applies the power of the brakemen to one truck while the double brake applies the same power to both trucks, could that train, in your judgment, have been stopped before running into those detached freight cars with the same number of brakemen, and the aid of the Hodge double brake on the rear car?

A. Yes, sir; if the single brakes held any. I think I could have stopped that train with the Hodge brake alone on the hind car, if the freight cars had been eight or ten car lengths further off. I had no other brake to rely on in the whole train. We couldn't depend on any other brake on that train but the Hodge brake. We couldn't depend on the Springfield brakes.

Q. 53. Had there been an application of the single brake to all the other cars of that train but the one that had the Hodge brake on, and one-half of these single brakes had been applied with the Hodge brake, do you think the accident could have been prevented?

A. I think so, if the single brakes held any.

Recross:

X Q. 54. Will not a single break', so far as it goes, hold just as well as the half of the double brake?

A. I am not prepared to answer this. I have never used the single brake.

X Q. 55. What is the double brake but the union of two single brakes, and the operating of the same together?

A. They ought to be just the same, if they were both equally good.

JOHN CHARTS.

Subscribed and sworn to before me this 8th day of October, 1872.

T. B. BEECHER,
Notary Public N. Y. County.

1566 **ISAAC L. WADLEIGH**, a witness produced on behalf of the complainant, testified as follows:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Isaac L. Wadleigh. My age is 51 years. My residence is New York City, and am at present engaged in letting room and steam-power at 317 East 22nd st., New York City.

Q. 2. Were you ever engaged as locomotive engineer *no* any railroads; if so, on what railroads?

A. Yes, sir; on the Stonington Railroad, and Western Railroad of Massachusetts.

Q. 3. About how long were you locomotive engineer on the Western Railroad, and what kind of trains did you run on that road?

A. A little over seventeen years. I run all kinds of trains that were run on the road.

Q. 4. During any part of the seventeen years, did you run on either of the New York and Boston express lines?

A. Yes, sir; both the night and day express.

Q. 5. For about how long did you run on these express lines, and between what points did you run?

A. I run on the night express-train 25 months, when it was first put on. I run the day express-train 14 years, 1 month, and 18 days. I run both those trains from Worcester to Springfield and return.

Q. 6. Do you remember, while you were running this day express-train, that a brake called the Springfield brake was put upon the cars of that train?

A. Yes, sir.

Q. 7. How well did these Springfield brakes answer for holding the cars of that train?

A. Well, they didn't answer very well.

Q. 8. What was the difficulty with them ?

A. They were a very poor thing, any way. The difficulty with 1567 the brakes was that you couldn't rely on them to stop the train either at a regular stopping place or where some unfor'seen thing occurred and you wished to stop the train. They were not to be relied on.

Q. 9. While these Springfield brakes were used on your train, do you remember any accident happening when the engine ran off the track ? If you do, please state the circumstances fully.

A. Yes, sir; when I was running east and came in sight of Brimfield turnout I saw a switch wrong, and I blew to brake, and tried to stop, but couldn't until we ran off the other end of the turnout into the bank.

Q. 10. To what cause was your inability to stop before running off due ?

A. We hadn't any brakes on the train that you could call brakes only the one on the tender, although they had the name of brakes.

Q. 11. To what brakes do you refer "that couldn't be called brakes" ?

A. What is called the Springfield brake.

Q. 12. When the Springfield brakes were used on your train, how well were you able to stop at stations, as a general thing ?

A. Well, we wasn't able to stop, as a general thing, well at all. We stopped as soon as we could. I used to give according to the place. If we wanted to stop at West Brookfield going west, I used to give them about three times the distance that I did when we had proper brakes on the train; also, at Palmer; then, sometimes we run by.

Q. 13. You say "give them about three times the distance." What do you mean by "give them" ?

A. Why, to shut off steam and give the brakesman distance to stop in.

Q. 14. What kind of brakes were used on the cars of said day-express train before these Springfield brakes were put on ?

A. The Hodge brakes.

1568 Q. 15. While the Hodge brake was used on that train, how well were you able to stop at stations, as a general thing ?

A. Well; very well.

Q. 16. While you ran on said day-express, were there any cars run in the train belonging to the Western Railroad which had on single brakes ?

A. Yes, sir.

Q. 17. Please state which brakes held the trains best, the Springfield brakes or these single brakes ?

A. The single brake. You could rely on the single brake for what it would do. The others were kept in as good order as you could keep them, but they wouldn't apply.

Cross-q. 18. For what purpose were cars of the Western road, with the single brake thereon, attached to the express-train run by you ?

A. To carry passengers.

Q. 19. Was the brake on the tender of your engine, which hauled the express-train, a good brake ?

A. Yes, sir.

ISAAC L. WADLEIGH.

Subscribed and sworn to before me this 8th day of October, 1872.

T. B. BEECHER,
Notary Public N. Y. County.

1569 FURTHER REBUTTING TESTIMONY ON BEHALF OF COMPLAINANT.

Testimony taken at New York, commencing April 25th, 1873.

ALBERT BRIDGES recalled by complainant.

Q. 1. Are you the inventor and patentee of what is called the swing bolster of railroad-cars?

A. 1. I am one of the inventors and patentees. It was invented and patented by Davenport & Bridges in 1841.

Q. 2. What was the object of this invention?

A. 2. To prevent the lateral shocks of the car-body by the concussion of the wheels against the rails.

Q. 3. How much longitudinal motion did you allow the swing-beam between the two truck-timbers between which it moved?

A. 3. Not any. The swinging bolster was allowed to play laterally between two cross-sills, with a friction sufficiently tight to prevent sudden lateral motion by the swinging of the pendulous links; should there
be space allowed for the bolster to swing *two* freely the lateral mo-
1570 tion would be felt more than it would be if retarded by the fric-
tion; therefore, it should have no longitudinal play.

Q. 4. Is or is not this swing-beam in general use on railroads?

A. 4. It is in general use on the railroads of the United States.

Q. 5. Are you acquainted with what is called the Tanner patent for double-acting car-brakes?

A. 5. I am.

Q. 6. Please state from your experience as a practical car-builder what effect longitudinal motion of the swing-beam would have upon the practical working of the Tanner brake?

A. 6. It would have no effect on the practical working of the brake, in my opinion, as the brakes draw the trucks towards the centre lever.

ALBERT BRIDGES.

Deposition of W'm H. Weightman, recalled for complainants, taken at New York, May 1st, 1873.

Direct examination:

1. Int. Have you recently made a diagram showing the operation of the Springfield brake, on a railroad car, on different curves, If so, please file the same marked "Weightman's diagram."

A. I have, and herein file the same as part of my answer. It is drawn to a scale of half an inch to the foot. The extreme length of the body represented in this diagram is 50 feet. The different radii represented are 800 feet, 500, 400, 300, 200, and 100 feet, and one of the drawings represents a car upon a straight track.

1571 2. Int. What is the length of the short chain between the windlass shaft and truck-lever; also, of the long rod and chain between said windlass and the truck-lever of the other truck?

A. The short chain is 3 feet 8½ inches; long rod and chain, 34 feet 10 inches on straight track.

3. Int. Can you by means of diagram fully illustrate what the effect would be of using said Springfield brake on a car running from a straight track on to curves of different radii, as represented in the diagram?

A. According to the diagram, a car in passing from a straight track on to curve of a different radii would have (the brakes being applied on a straight track) the effect of lengthening the short chains, and shortening the long rods and chains, or vice versa, shortening the short chains, and lengthening the long rods and chains, as by diagrams, with the brakes applied at the windlass, on the inside of curves, the differences are, on short chains, as follows, viz:

For	800	ft.	radius	track,	½	an inch	longer.
"	500	"	"	"	1⅛	inches	"
"	400	"	"	"	1¾	"	"
"	300	"	"	"	2	"	"
"	200	"	"	"	3	"	"
"	100	"	"	"	6	"	"

And on long rods and chains as follows, viz:

For	500	ft.	radius	track,	⅛	of	an	inch	shorter.
"	400	"	"	"	¼	"		"	"
"	300	"	"	"	½	"		"	"
"	200	"	"	"	1¼	"		"	"
"	100	"	"	"	1⅝	"		"	"

4. Int. What would be the effect of these variations on short and long chains and rods, the brakes being applied on a straight track, and the car then run on to a curve?

1572 A. It would tighten the brakes on one truck, while it loosened them on the other.

W. H. WEIGHTMAN.

New York, *May 1st*, 1873.

Louis E. Rood, a witness produced on the part of the complainant, and being duly cautioned and sworn, testifies as follows:

Int. 1. What is your name, age, residence, and occupation?

A. Louis E. Rood; I am 59 years old; reside in New York City; and am a car inspector on the New York, New Haven & Hartford Railroad at the passenger station in New York City.

Int. 2. How long have you been car inspector?

A. For the last twenty years, for the New York and New Haven Railroad Co. in New York City, now the New York, New Haven and Hartford Railway Company.

Int. 3. Do you remember of a certain car-brake called the Springfield brake being put on the New York & Boston express line cars about the year 1857?

A. Yes; I do.

Int. 4. Who had to attend to the adjusting of those Springfield brakes on said line cars when they were here in New York City?

A. I had charge of them.

Int. 5. Please state, if you know, how those Springfield brakes worked; state fully.

A. Those brakes never worked properly, they gave me a great deal of trouble to keep them adjusted; they would oftentimes, in going into the yard at 27th street, bind on the curve so that we would have to let out the connecting-rods between the brake beams to allow the car
1573 to go round the curve; sometimes when the cars were under considerable headway they would go round the curve into the yard without letting out the connecting-rods; we were obliged to take a great deal of pains in adjusting them in the yard, and they required such nice adjustment on account of their not being in any way self-adjustable that many of the men under me were unable to adjust them, and I was obliged to assist in their adjustment myself, as a general

thing. Every time the cars came into the yard we had to adjust these brakes, so as to be able to hold the cars in switching them, to make up the trains, and this adjustment was such as to allow them to operate when on a straight track, so that in order to take the car round the curve, on leaving the yard, we had to give the nuts on the connecting-rods a certain number of turns back to loosen the brakes, and when we got the car round the curve, and out on the straight track, we had to give the nuts the same number of turns up again, so as to leave the brakes adjusted when the train started for Boston. We had to follow the trains up from the yard to 32nd street, where the cars were hitched together, and the locomotive attached, in order to get the nuts screwed up. The cars stopped some little time at 32nd street, and this gave us sufficient time to screw the nuts up.

Int. 6. What brakes were used on said line cars before and after these Springfield brakes?

A. The Hodge brake.

Int. 7. How many men did you have to assist you in adjusting these Springfield brakes?

A. Two regular men, and oftentimes I had to call in others to assist us.

Int. 8. Did you or not hear any complaints made about the working of the Springfield brakes; and, if so, from whom, and what was the nature of such complaints?

A. I did; the train brakemen generally complained that they could not hold their train; this complaint was very often made.

1574 Int. 9. About how close to the wheels were the brake shoes of these Springfield brakes, after you had adjusted them, when the train was ready to start for Boston?

A. We adjusted them as close as we could, and not have the shoes bear on the wheels while the cars were in motion.

Int. 10. Did you or not consider this Springfield brake a safe brake for a passenger train of cars?

A. I did not, for the reason that it was so very liable to get out of adjustment, and even when adjusted in the very best manner, it would not work well. M'r Hoyt, the superintendent of the New York and New Haven Railroad, often came to me while those Springfield brakes were on the cars, and asked me if I could not fix the brakes so they would work. I told him I was doing the very best I could with them. He said there were a great many complaints about their working badly.

Int. 11. How does the expense of keeping these Springfield brakes in repair compare with that of other brakes you have had to do with?

A. The expense would be very much greater than any other brake I have had to do with, and would be so great that I do not think any railroad company could afford to use them.

LOUIS E. ROOD.

Sworn to before me this 1st day of May, 1873.

WESLEY GLEASON,
Notary Public, N. Y. County.

1575 *Corrections by Emery Stebbins and Edward Lang, witnesses for defendants, of portions of their testimony given for defendants.*

BOSTON, *April 26, 1873.*

M'r Emery Stebbins, a witness on the part of the def'ts, called upon the reporter, M'r Yerrinton, and said that he wished to make a correction of his testimony, given on the 21st of April, 1873, in respect to the model about which he was questioned at that time, marked "Def't's Exhibit, Springfield Brake No. 3." He stated that inasmuch as he had said in that answer that that model correctly represented the Springfield brake used upon the New York and Boston line cars in 1857, he now wished to say that the truck levers in the actual line cars may have been a little nearer the ends of the trucks than shown in that model; but that that would not make any difference in the working of the brake.

By M'r Cozzens:

X-int. 2. You also testified the other day that when the New York and Boston line cars, having the Springfield brake upon them, 1576 reached Springfield, where you were at that time stationed as car-inspector, you, during the first part of the time that that brake was used on those cars, adjusted the brakes there?

A. I did; yes, sir, more or less.

X-int. 3. Did you, after this, when you found that the brakes were too loose take up the slack in them?

A. Yes, sir, some of them; when we found they were so loose they would not operate well we took them up.

X-int. 4. This sort of thing you did as long as the brake continued in use?

A. Yes, sir.

EMERY STEBBINS.

APRIL 26, 1873.

M'r Edward Lang appeared and stated that he would like to be more correctly understood in reference to the testimony given by him in this case, on behalf of the def'ts, on the 19th of April, 1873, in respect to the complaints made by G. F. Lincoln and H. M. Rogers about the Springfield brake; that he now observes that the question put to him the other day was whether complaints had been made to him "before" the men referred to went to Springfield to testify; that he did not, in answering the question, notice about the word "before," or whether it was before or after, and for that reason made the answer that he did at that time, namely, "Not that I remember in particular." But that the correct statement of the fact is as he gave it in his testimony in answer to interrogatory 13, on page 373 of the complainant's accounting record.

EDWARD LANG.

1577 TESTIMONY ON BEHALF OF THE COMPLAINANT, TAKEN AT BOSTON AND PROVIDENCE.

Deposition of William R. Hutchings, taken at Boston April 26, 1873.

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

A. William R. Hutchins; age, 53; residence, Boston; occupation, car-inspector on the Boston & Albany Railroad.

Int. 2. About how many years have you been car-inspector on that railroad?

A. Twenty years; that is, the Boston & Worcester and Boston & Albany.

Int. 3. During those twenty years where have you been stationed as such car-inspector?

A. At Boston.

Int. 4. Do you remember that about the year 1857 a brake called the Springfield was put upon the cars of what was called the New York & Boston express line.

1578 A. Well, I recollect a brake, but I can't say as I really understood it by that name; there was a brake put on there, and from what I have learned about it since, to the best of my judgment, that is what it was called, the Springfield brake.

Int. 5. As car-inspector at Boston during the period that this Springfield brake was used on these line cars, was it within your duty to look over the cars and adjust said brakes?

A. Yes, sir, it was.

Int. 6. About how often, while the Springfield brakes were on those line cars, did you adjust them at Boston?

A. Every day, to a greater or less degree; sometimes more, sometimes less; some of them wanted a great deal of work, and some of them didn't want so much.

Int. 7. I suppose you did all that was necessary?

A. All that was necessary.

Int. 8. In so adjusting these Springfield brakes, how tight did you make the chains?

A. Well, it was ruleable to have the slack about all taken up on the chain; that would consequently fetch the brake-shoes quite near to the wheels in having the slack of the chains taken up.

Int. 9. And that was the way you did it, was it?

A. Yes, sir.

Int. 10. In so adjusting those brakes at Boston, how hard did you try to make them work well?

A. Well, I tried very hard sometimes, very hard; it was pretty hard work to keep them in order.

Int. 11. On the whole, taking one time with another, how hard did you try to make them work well?

A. Well, I should say, to answer the question, it was hard work all the time; I did the best I could to make the brakes effective and do the most good, and work as well as they would.

Int. 12. Did the best you could all the time?

1579 A. Yes, sir; all the time.

Int. 13. About how long did it usually take you to adjust those Springfield brakes on one train?

A. Well, there were two men of us at work; we generally worked together, and it took us on an average about two hours every day to adjust the brakes on one train; one train was at Boston one day, and was adjusted, and the counterpart train was in Boston the next day, and was adjusted.

Int. 14. How many of these line cars, on an average, were there in each one of those trains?

A. There were two sitting up cars, a smoker, baggage-cars, and mail-car, five in all.

Int. 15. Please state whether you heard complaints from the brakemen on the train about the working of those Springfield brakes.

A. I have, at different times; the men would come and say, "Hutchins, can't you adjust these brakes?" not speaking in just that way: "Can't you fix these brakes to make them work, so that they will hold the train? We can't do anything with those brakes at all." My reply was that I would do the best I could.

Int. 16. Well, about how often did these complaints come to you, as near as you can tell?

A. Well, I should think it was about every day.

W'M R. HUTCHINS.

(No cross examination.)

1580 *Deposition of John Copithorn, taken at Boston April 26, 1873.*

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

A. John Copithorn; age, 25; residence, Somerville; occupation, car-builder.

Int. 2. By what railroad company are you employed?

A. Boston, Lowell and Nashue.

Int. 3. How long have you been in the employ of that company?

A. Well, I have been in their employ about eight years; during that time I have left twice; I have been off about a year out of the eight.

Int. 4. At what place do you do your work for said company?

A. I work in the car shop at East Cambridge.

Int. 5. Do you remember that, sometime last year, brakes called the Springfield brakes were put up on some of the cars of the Boston and Lowell R. R.?

A. Yes.

Int. 6. State who did the work of putting those brakes on to those cars.

A. It was myself and a man named John Hillock put them on.

Int. 7. How many cars, on that road, had those brakes on them?

A. There were four, I believe; three passenger-cars and a baggage-car.

Int. 8. Did you have anything to do with adjusting those Springfield brakes, and keeping them in order while they were on those cars?

A. I did.

Int. 9. During the time that you took part in adjusting those
1581 brakes, and keeping them in order, did any other man work with
you, and if so, who was it?

A. A man by the name of John Hillock worked with me, mostly; a man by the name of McAllister worked part of the time.

Int. 10. Do you remember that, while those Springfield brakes were on that train, there was a trial or test of them made on the road during about a week?

A. Well, there was a trial made.

Int. 11. During this time, did you work at adjusting and taking care of the Springfield brake on these cars?

A. I did.

Int. 12. Please state how you went to work to adjust the brakes on those cars at this time.

A. We used to put a piece of wood, about 3-8 of an inch thick, between each brake-shoe and the wheel, and tighten the connecting-rods until the brake-shoes came up to the wood. After we had done that, we screwed up the swivels on the long brake-rods, & tightened them up until we had taken up all the slack of the chain on the long rod and the short rod, to'. We then took the pieces of wood out from between the brake-shoes and the wheels.

Int. 13. Please state whether you had any trouble in making these adjustments of those brakes; and if so, in what respect did you have trouble?

A. We had trouble in getting them both alike on both ends. We

Int. 4. Do you remember that about the year 1857 a brake called the Springfield was put upon the cars of what was called the New York & Boston express line.

1578 A. Well, I recollect a brake, but I can't say as I really understood it by that name; there was a brake put on there, and from what I have learned about it since, to the best of my judgment, that is what it was called, the Springfield brake.

Int. 5. As car-inspector at Boston during the period that this Springfield brake was used on these line cars, was it within your duty to look over the cars and adjust said brakes?

A. Yes, sir, it was.

Int. 6. About how often, while the Springfield brakes were on those line cars, did you adjust them at Boston?

A. Every day, to a greater or less degree; sometimes more, sometimes less; some of them wanted a great deal of work, and some of them didn't want so much.

Int. 7. I suppose you did all that was necessary?

A. All that was necessary.

Int. 8. In so adjusting these Springfield brakes, how tight did you make the chains?

A. Well, it was ruleable to have the slack about all taken up on the chain; that would consequently fetch the brake-shoes quite near to the wheels in having the slack of the chains taken up.

Int. 9. And that was the way you did it, was it?

A. Yes, sir.

Int. 10. In so adjusting those brakes at Boston, how hard did you try to make them work well?

A. Well, I tried very hard sometimes, very hard; it was pretty hard work to keep them in order.

Int. 11. On the whole, taking one time with another, how hard did you try to make them work well?

A. Well, I should say, to answer the question, it was hard work all the time; I did the best I could to make the brakes effective and do the most good, and work as well as they would.

Int. 12. Did the best you could all the time?

1579 A. Yes, sir; all the time.

Int. 13. About how long did it usually take you to adjust those Springfield brakes on one train?

A. Well, there were two men of us at work; we generally worked together, and it took us on an average about two hours every day to adjust the brakes on one train; one train was at Boston one day, and was adjusted, and the counterpart train was in Boston the next day, and was adjusted.

Int. 14. How many of these line cars, on an average, were there in each one of those trains?

A. There were two sitting up cars, a smoker, baggage-cars, and mail-car, five in all.

Int. 15. Please state whether you heard complaints from the brakemen on the train about the working of those Springfield brakes.

A. I have, at different times; the men would come and say, "Hutchins, can't you adjust these brakes?" not speaking in just that way: "Can't you fix these brakes to make them work, so that they will hold the train? We can't do anything with those brakes at all." My reply was that I would do the best I could.

Int. 16. Well, about how often did these complaints come to you, as near as you can tell?

A. Well, I should think it was about every day.

W'M R. HUTCHINS.

(No cross examination.)

1580 *Deposition of John Copithorn, taken at Boston April 26, 1873.*

Direct examination by M'r Cozzens:

Int. 1. What is your name, age, residence, and occupation?

A. John Copithorn; age, 25; residence, Somerville; occupation, car-builder.

Int. 2. By what railroad company are you employed?

A. Boston, Lowell and Nashue.

Int. 3. How long have you been in the employ of that company?

A. Well, I have been in their employ about eight years; during that time I have left twice; I have been off about a year out of the eight.

Int. 4. At what place do you do your work for said company?

A. I work in the car shop at East Cambridge.

Int. 5. Do you remember that, sometime last year, brakes called the Springfield brakes were put up on some of the cars of the Boston and Lowell R. R.?

A. Yes.

Int. 6. State who did the work of putting those brakes on to those cars.

A. It was myself and a man named John Hillock put them on.

Int. 7. How many cars, on that road, had those brakes on them?

A. There were four, I believe; three passenger-cars and a baggage-car.

Int. 8. Did you have anything to do with adjusting those Springfield brakes, and keeping them in order while they were on those cars?

A. I did.

1581 Int. 9. During the time that you took part in adjusting those brakes, and keeping them in order, did any other man work with you, and if so, who was it?

A. A man by the name of John Hillock worked with me, mostly; a man by the name of McAllister worked part of the time.

Int. 10. Do you remember that, while those Springfield brakes were on that train, there was a trial or test of them made on the road during about a week?

A. Well, there was a trial made.

Int. 11. During this time, did you work at adjusting and taking care of the Springfield brake on these cars?

A. I did.

Int. 12. Please state how you went to work to adjust the brakes on those cars at this time.

A. We used to put a piece of wood, about 3-8 of an inch thick, between each brake-shoe and the wheel, and tighten the connecting-rods until the brake-shoes came up to the wood. After we had done that, we screwed up the swivels on the long brake-rods, & tightened them up until we had taken up all the slack of the chain on the long rod and the short rod, to'. We then took the pieces of wood out from between the brake-shoes and the wheels.

Int. 13. Please state whether you had any trouble in making these adjustments of those brakes; and if so, in what respect did you have trouble?

A. We had trouble in getting them both alike on both ends. We

could not get the brake-shoes so that they would bear on the wheels of each truck alike.

Int. 14. During this time, about how long did it take you to adjust the Springfield brakes on those four cars?

A. It took us about an hour from the time we went at them to do it; every time we had to adjust them, whether it was every day or every two days, every time we had to adjust them it took about an hour to do it, all the time we had, anyway.

1582 **Int. 15. About how much time did you have to adjust them in?**

A. About an hour; the train stood there an hour and ten minutes, but it took us about five or ten minutes to get our tools and get up to the car-house; it was just about an hour.

Int. 16. State whether you were able to get the adjustment finished within this hour?

A. No, we were not, always.

Int. 17. While those Springfield brakes were on those cars, did you hear any complaints from the brakemen about how they worked?

A. I did.

Int. 18. About how often did you hear such complaints?

A. Every day we would go to adjust them.

Int. 19. What were the complaints?

A. They would swear and say they could not make them work; could not make them hold; they would run by stations; they could not see why it was. And they would try to blame us fellows; say we did not adjust them right; they could not make time with them they said.

Int. 20. While you took part in adjusting those brakes, how hard did you try to adjust the brakes?

A. I tried as hard as I could; worked every way and tried to make them work; tried almost every way.

Int. 21. How difficult do you consider it to be to adjust those Springfield brakes so that they will work?

A. I call it pretty difficult. I couldn't adjust them so that they would work on all the wheels alike, and I don't believe any other man can get them so that they will work just right.

Int. 22. Did M'r Benjamin C. Read ever give you any instruction about what to do to adjust those brakes?

A. Yes, sir; he used to give us directions about the work all
1583 **the time; he would tell us what to do to them; and we would do**
as he said.

Int. 23. State whether or not M'r McAllister, of whom you have spoken, was competent to carry out the instructions received from M'r Read about how to adjust those Springfield brakes.

A. He was.

Int. 24. Do you know M'r S. M. Whipple?

A. I do.

Int. 25. You have said that you and Hillock put those Springfield brakes on to those cars; in putting them on, did you go by anybody's instructions, and, if so, by whose?

A. We went by M'r Read's and M'r Whipple's instructions.

Int. 26. State whether M'r Whipple was present at any time when you were adjusting those Springfield brakes.

A. He was.

Int. 27. About how often was he so present?

A. He was there a number of times.

Int. 28. At any time when M'r Whipple was present at the adjust-

ment of the brakes, did he take any part in adjusting them; if so, what did he do?

A. He did; he tightened the swivels on the long rods; he stood right there near us, and sometimes he would give them a turn, and sometimes he would tell us how to tighten them; I don't mean to say he did it all the time himself.

Int. 29. About how often did he do this?

A. Several times; I can't state how many; he and M'r Read would be there with us some of the time; M'r Read would come every time and tell us what to do, and then go off.

JOHN COPITHORN.

(No cross-examination.)

1584 *Deposition of Olney L. Smith, recalled for complainant, taken at Boston April 29, 1873.*

Int. 1. Please state whether you were present at certain experiments with the Springfield and Tanner brakes on the Providence and Worcester Railroad on the 28th and 29th of March, 1873, at which also were present M'r S. M. Whipple and M'r Alfred Berney.

A. Yes; I was present.

Int. 2. Please state whether on the first of these two days, when the experiment with the Tanner brake was made, you experienced any difficulty in ascertaining the indications of the scales, and, if so, what difficulty.

A. We did experience difficulty, owing to the high speed at which the engineer drew us.

Int. 3. Please state at what speed the engine drew you during the experiments with the Tanner brake.

A. The first part of the time, in going away from Providence, as near as I could judge from the movements of the car, the engine was drawing us at about twenty miles an hour.

Int. 4. Please state how well you were able, at this speed, to take indications from the scales.

A. I could not take indications at that speed, because the movements of the index of the scales were so rapid that it would be impossible to determine at what figures it was pointing; the index seemed to go almost as quick as lightning at that speed.

Int. 5. Finding this to be the case at this speed of twenty miles an hour, what did you do?

A. We got the speed down to about ten to twelve miles an hour.

Int. 6. After reducing the speed to ten to twelve miles an hour, did you run through the "Ledge curve," so called?

A. Yes; we did.

1585 Int. 7. When taking the indications from the scales, where were you, and what did you do?

A. I sat right over the scales at the south end of the car.

Int. 8. What did you do?

A. I took all the indications at my end of the car while passing through the curves.

Int. 9. Please state how you took the indications.

A. I took the number of points stated on the scale at the extremes each way of the movements of the index; as, for instance, if the index moved between, say, 24 and 28 pounds, I would take the 24 and the 28, but pay no attention to the intermediate pounds in between.

Int. 10. While you were doing this, where was M'r Berney?

A. He was at the scale at the north end of the car.

Int. 11. Please state what was the amount of variation with the Tanner brake at your end of the car in going through the "Ledge curve."

A. The brake was set at twenty-eight pounds on the straight track before entering the curve, and it varied from 28 to 40 pounds on the curve.

Int. 12. Please state about what portion of an inch the index would have to move to indicate two pounds.

A. A very small portion of an inch.

Int. 13. Please state whether you tried the Tanner brake in this experiment on the curve known as "Eaton's curve."

A. Yes; we tried it on that curve.

Int. 14. Please state what variation the scale showed on that curve.

A. The brake was set on the straight track before entering the curve at twenty-eight pounds; the car standing still on the straight track; as the car went on through the curve the scales varied from 28 to 32 pounds.

1586 Int. 15. Did you also in this Tanner experiment run through the Paint-shop curve?

A. We did.

Int. 16. Please state how you took the indications from the scale while running through said curve.

A. I took the two extreme points; that is, when the index-figure went one way I waited until it stopped its movement in that direction and then took the number of pounds at the extreme of its movements in that direction, and when it went in the other direction I waited until it stopped that way and took the number of pounds at the extreme of its movements that way; the variation made on my end of the car was from 6 to 18 pounds.

Int. 17. In trying the Tanner experiment on the Paint-shop curve, did the car stop on any part of the curve?

A. No; it did not stop at all; it did not stop until it reached the straight track at the other end of the curve.

Int. 18. Please state how much a person at the other end of the car could tell about what your scale showed, on going through this curve, at the instant that the scale at such other end showed any given number, as, for instance, either six or thirty pounds.

A. He could not tell anything about it; it would be impossible for him to see my scale unless he walked right up to it.

Int. 19. After he left his scale when it indicated a certain number of pounds and walked over to see your scale, please state how he could tell what changes were taking place in his scale while he was walking over to yours and back again, the car being in motion through a curve.

A. He could not see what his scale indicated while he was walking to and returning from my scale, so that it would be impossible for him to tell what variations his scale was showing while he was looking at mine.

1587 Int. 20. Please state whether on the next day of these experiments, when the Springfield brake was tried, you heard any conversation on the subject of the indications which the scales were giving for the Springfield brake between M'r Whipple and M'r Berney, and, if so, please state what you heard.

A. At the first application of the Springfield brake, as we were going up under the bridge, just out of the yard in Providence, where there is a curve, the scales indicated a very large variation between the two trucks. I heard M'r Berney say to M'r Whipple, "you must make a better show than this—this won't do, Whipple." M'r Berney and M'r Whipple traveled back and forth between the two scales and I heard M'r Berney make that remark, and M'r Whipple then got down underneath the car and adjusted the rods; I heard him adjusting the brake-rods.

Int. 21. Please state whether you came to Boston last Saturday afternoon, April 19, 1873; and if so, for what purpose?

A. I did. I was requested to come by M'r Whipple, to give my testimony in the case about these trials.

Int. 22. Upon reaching Boston that day, did you have an interview with M'r Whipple? and if so, please state what the interview was.

A. I met M'r Whipple and he asked me to step into a room with him. He said he wanted to fix matters. We went into the room and closed the door, and sat down to a small table. He wanted to compare M'r Berney's notes with mine. I showed him mine. He said there was too much variation between my notes about the Springfield brake and M'r Berney's. I inquired of him what alteration he wanted to make. He said he wanted to change 32 pounds to 24 pounds in my notes to correspond with M'r Berney's figures, and then have me swear to it. He said he wanted me to corroborate M'r Berney. I told him that he
1588 couldn't do it, that I sat to the scales by his request, and he told me he should call upon me to swear to the notes I took; and I told him that I paid particular attention and I was sure that my notes were correct and I could not allow him or any one to change them. He said that he couldn't put me on the stand unless we could change my notes to correspond with M'r Berney's, as it would be of no benefit or use to him; it would knock or spoil the experiment. He said that he was sure that our scales both set on the start at twenty-four pounds. I asked him to put me on the stand and let me swear to the notes I had, and he said he couldn't do it as it showed to' much variation.

Int. 23. Please state whether the cast-iron wheels which are used for car-wheels are even or true, or perfectly round on their circumferences.

A. They are not, and there is no wheel round unless it is turned free from uneven places.

Int. 24. Please state what effect this lack of roundness and these inequalities of surface will have upon the brake-shoes, and hence upon the indications given by scales as they were tried in the above-mentioned experiments.

A. It would have the effect of shaking the scales very much, as the higher and lower places on the wheels respectively came round against the brake-shoes, they would cause the scales to vary from two to six pounds at least, no matter what speed we were going, whether high or low.

Int. 25. Please state what in your judgment would be the effect in the use of the Tanner brake as to the equality of the action of the brake upon the two trucks of a car when the car with the brake applied passes from a straight track on to a curve, provided the line of draft from the centre lever to the tops of the truck-levers be substantially in a line with the king-bolts of the car.

A. It would equalise the power between the trucks.

1589 Int. 26. What in your judgment would have been the effect in the experiment with the Tanner brake above testified to, in going over the curves, had the truck-levers in the car been so arranged that the line of draught from the centre-lever to the tops of said truck-levers would have been substantially in a line with the king-bolts?

A. I think there would have been but little if any variation between the two trucks.

Int. 27. As you have seen the Springfield brake recently in use upon one car upon the Providence and Worcester Railroad, placed there by M'r Whipple, or at M'r Whipple's request, please state what would be the difficulty in keeping a brake of that character in proper adjustment.

A. I should say the difficulty would be great to keep those brakes properly adjusted so as to make good stops, and we shouldn't use the brake if we could get any other. It requires too nice an adjustment to make it a practical brake.

Int. 28. Please state how many cars having upon them double-acting brakes are in use upon the Providence and Worcester Railroad.

A. Thirty-five.

Int. 29. Please state how many men are employed upon said road for the purpose of attending to the adjustment of the brakes on those cars.

A. Two men in Providence and two in Worcester. The two men we have in Providence spent only about two hours a day in adjusting the brakes of all the thirty-five cars.

Int. 30. What wages are paid these men per day?

A. We pay the first man $2.75, and the man under him $2.25 per day; that makes an average to each man of $2.50 per day.

Int. 31. How many hours is your working day?

A. Ten hours.

1590 Int. 32. Suppose the Springfield brake was in use upon all of these thirty-five cars, how many men, in your opinion, would it take to keep them in proper adjustment to run?

A. I should think it would take not less than five or six men, working all the time, and they couldn't half do it so that the cars could make good stops even then. I don't think there would be time enough between the coming in and going out of the trains for the men to adjust the brakes.

Int. 33. When you used the Tanner brake on your road, as you have previously testified in this case, how many cars had you with that brake on?

A. We had seventeen.

Int. 34. How many men did it require, and how much of their time was needed, to adjust the Tanner brakes on those seventeen cars?

A. Well, we employed one man at Providence, and nobody at all at Worcester, and he would not spend more than one hour a day in adjusting the brakes on those seventeen cars.

OLNEY L. SMITH.

(No cross-examination.)

***Deposition of Hervey Waters, recalled for complainant, taken at Boston, April 29th,* 1873.**

Direct examination by M'r Cozzens:

Int. 1. Please state whether you have examined the models introduced in this case on the part of the defendants, and marked "Defendant's Exhibits, Springfield brake, Numbers 1, 2, and 3," and whether you understand the construction and operation of the mechanism shown in said models.

1591 A. I have examined the models, and I understand the mechanism and modes of operation.

Int. 2. Please state whether you have also examined any car on the Boston and Albany Railroad which has upon it the brake known as the "Springfield brake," and also any other cars on said road; and, if so, please state when you made such examination, and whether you find any errors in any respect in any of the said models as compared with said cars.

A. I examined yesterday, April 28th, 1873, one of the cars having on it a Springfield brake on the Boston and Albany road, and some other cars that were standing with it, and I find that the model inquired of do not compare correctly with the cars as to the size or breadth of the passage-way between the cars of the train at the railing at the outer end of the platform. I found the cars were about twenty-three inches wide in that passage-way, and I find the models represent that passage-way as about thirteen inches or a little more. I also found that on the cars the windlassos for operating the brakes were considerably further out from the centre line of the car than is represented in two of the models, especially in the model "Springfield brake, No. 1," where the model represents the windlasses as about eighteen inches from the center line of the car, while in the car itself which had on the Springfield brake, this distance is about twenty-two inches. The model "No. 2" represents the windlasses about nineteen and one-half inches from the center line of the car.

Int. 3. Please state in what respect, if any, you consider these differences in the models to be important.

A. The importance to be attached to them is in connection with the windlasses themselves in their position to operate the brakes. It is one of the difficulties to be overcome (and which was overcome by the invention of Batchelder and Thompson) that the windlass is obliged
1592 to be considerably at one side of this passage-way, and conse-
quently considerably at one side from the central line of the car in the operation of the brakes; and in consequence of that position, considerable difficulty existed in the old Springfield brakes in the swiveling of the trucks as connected with the braking of the cars.

Now everything else being equal in the old Springfield brake, the nearer the windlass is to the central line of the car, the less difficulty there will be in operating the brake.

Int. 4. Please state whether any of the said models are so constructed that the line of draught from the windlasses to the tops of the truck-levers is or can be in line with the king-bolts of the car.

A. No; neither of them is so constructed.

Int. 5. M'r Henry Waterman, an expert on behalf of *of* the defendants, has testified in this case in his 36th direct answer, that "If the draft rod in the Springfield brake passes from the windlass to the top of the truck lever in a line with the king-bolt of the truck, * * the action upon the brake will not be seriously *e*ffected by the swiveling of the truck on passing from a straight line to a curve, or vice versa," and then, referring to defendant's exhibit "Springfield brake, No. 2," says: "Now, if I turn the top of the truck lever over until the tension rod practically passes through the line of the king-bolt, it is not practically affected at all by the swiveling of the truck. So with the action that takes place with the lever at the other end of the car—by turning the top of the lever over to bring the draft rod on a line with the king-bolt, it prevents the swiveling of the trucks from affecting the tension
1593 of the draft rod." Is said model "Springfield brake, No. 2," con-
structed so as to admit of any such operation as the witness

Waterman here describes? and if not, state what would have to be done to it in order to give it such operation.

A. As I understand M'r Waterman, he means to say that if these brakes were so constructed that the connecting rods from the windlasses to the truck levers drew in lines radial with the king-bolts, then the swiveling of the truck would not seriously affect the ten*is*on of those rods; and in that I think he is quite correct. But they are not so constructed. If the space between the connecting rods where they pass through the staples upon the body of the car be measured, it will be found about three and a quarter inches from centre to centre of the rods; and if the distance from the central line of the car to the centre of the windlasses be measured, it will be found one inch and five-eight's, which is half of the 3¼ inches. So there is no misunderstanding the construction of this brake apparatus in that respect. The connecting rods are made to draw parallel to the sides of the car and not radial to the king-bolts, and therefore in order to make them draw radial to the king-bolts the brake would have to be reconstructed.

Int. 6. You say in substance that in the old Springfield brake as it was organized, the draft of the rods connecting the windlasses with the truck levers could not be parallel to the sides of the car and radial with the king-bolt. Is it or not important in order to make a good brake the draft of such connecting rods should be parallel with the sides of the car and at the same time radical with the king-bolts?

A. It is important, because it is important that all the rods of the brake should pull parallel with the sides of the car; for it is important that the two rods which connect the two brake beams in the trucks should pull at right angles to the axles of the trucks (which will 1594 be parallel with the sides of the car), so as to pull the shoes properly upon the wheels and not bring them upon the wheels diagonally; and it is also important that the windlass rods should pull parallel with the rods connecting the truck levers so that the truck levers shall not be pulled sideways, but shall be pulled directly edgeways, in order to get the greatest strength and not bend them over sideways.

Hence it is important that all the rods of the brake should pull parallel with the sides of the car or parallel with the central line of the car—which is the same thing—and also that the rods connecting with the truck levers should at the same time pull radially to the king-bolts as nearly as may well be. Now both of these conditions cannot be obtained when the rods which connect directly with the truck levers are greatly to one side of the centre of the car—as they were in the old Springfield brake, because if they are and they do pull radially, then they will not pull parallel to the central line of the car, but diagonally to it.

Int. 7. M'r Waterman has also testified that as the Tanner brake is shown in the drawing annexed to the Tanner patent, the line of draft from the centre lever to the tops of the truck levers is, as he states, not in line with the kingbolts of the car. Will you please look at said drawing and state what will be the said line of draft according to the drawing.

A. On reference to the drawing, it will be seen that the points of connection of the brake-rods H 2 and G 2, with the break-levers of the trucks, are nearly in the central line of the car, and it will also be seen that the points of connection of those rods with the centre lever are a little to one side of the central line of the car; so that H 2 and G 2 do not pull parallel to the sides of the car absolutely, nor do they pull radial to

the king-bolts absolutely, but they do pull nearly radial to the king-
1595 bolts and nearly parallel to the sides of the car—both of which they
could not do if they occupied the position of the windlass connecting-rods D 2 and C 2, which are each removed out from the central line of the car as far as the windlasses themselves are, and as far as they were in the old Springfield brake; and is perfectly obvious, upon comparison of the rod H 2 with the rod D 2, that H 2 pulls substantially radical with the kingbolt, while D 2 is very far removed from such radial line, notwithstanding that both rods H 2 and D 2 are nearly parallel to the sides of the car; and this difference between the lines of draft of these rods H 2 and D 2 represents the actual differnace between the Batchelder and Thompson and the Springfield brake in respect to radial draft. There is not the slightest difficulty in understanding that difference; it is perfectly obvious that if the rod D 2 was connected with the truck lever at a point opposite to K 1 (where the rod H 2 connects with said truck), then the swiveling of the truck would affect much more sensible the tension of the rod D 2 than it now affects the tension of the rod H 2.

Int. 8. Please state whether in the above-mentioned models "Springfield brake Nos. 1, 2, and 3," there is any difference in organization; and also whether there is any difference in organization between any of said models and the old Springfield brake testified about at the trial at Albany on the Tanner patent, referred to in your sixth direct answer, on page 330, of the complainant's accounting record in this case.

A. All three of the models inquired of differ in their organization one from another. "No. 1" is substantially the same organization as the old Springfield brake which was described at the trial to which I refer in my sixth direct answer in this case, but the windlass in "No. 1" is at a greater distance from the truck of the car than it was in the old Springfield brake, so as to give considerably more length of chain in the
short direct connection to the nearest truck, and therefore the
1596 difficulty in the old Springfield brake is somewhat modified for
the better by that difference.

Int. 9. Please state whether in said models you find any inequalities in the wheels, and if so, state what effect such inequalities will have upon the working of the models in connection with the operation of the brakes?

A. The wheels in the models are not round. They were round when they were made, but the wood has shrunk and they have become oval, so that there cannot be any correct working of the models in connection with the brakes to show the general character of the contrivance, because the inequalities in the wheels consequent upon this shrinking will produce such an effect upon the shoes of the brakes as would be likely to mislead in any experiments made with said models upon the track when using the brakes.

HERVEY WATERS.

(No cross examination.)

Deposition of Edward Lang, recalled for complainant, taken at Boston, April 30th, 1873.

Examined by M'r Cozzens:

Int. 1. Will you please state how many cars having double acting brakes are running daily upon the Boston and Providence Railroad at the present time?

A. There are eighty, if not more.

Int. 2. Please state how many men are employed by said railroad company, to attend to the adjusting of the brakes on these eighty cars.

1597 A. I have three under me here at Boston, and M'r Lightner at Roxbury has five more; I think making eight in all.

Int. 3. About how much time per day is occupied by these eight men in adjusting the brakes on these eighty cars?

A. I should think fifteen minutes a day for each of the eight men would cover everything about the brakes, because some days it might take them half an hour to adjust the brakes on a train, and then they might not have to do anything to the brakes for two or three days; that is my best judgment. Fifteen minutes a day ought to give them plenty of time. It ought not to take a man a great while to adjust a Hodge brake.

Int. 4. You have heretofore testified about the Springfield brake, which were recently used for a short time on two of the cars of the Boston and Providence Railroad. Now, suppose that all these eighty cars you have spoken of were provided with Springfield brakes, about how many men do you think, from your experience with said two cars, would be required to keep those eighty Springfield brakes in proper adjustment for the cars to run?

A. Well, I make bold to say, about the Springfield brakes, that they would have to be adjusted every day, because, if you have any regard for the safety of your passengers, you must see that the Springfield brake is kept very nicely adjusted all the time, in order that it may have any efficiency. I think, to keep the Springfield brake properly adjusted on this number of cars—eighty cars—it would take five men all their time, every day; I wish to speak entirely within bounds.

Int. 5. How many hours constitute your working day?

A. Ten.

Int. 6. And what wages do the men who adjust the brakes on your road get, on the average?

A. Two dollars and a half a day.

1598 Int. 7. When the Tanner brake is adjusted on one car, about how long does it take to adjust it?

A. I should say six or eight minutes would be a fair average, to the best of my judgment.

Int. 8. How long is the main line of the Boston and Providence Railroad?

A. About forty-four miles.

EDWARD LANG.

(No cross-examination.)

Deposition of Thomas J. Hillock, taken at Boston, May 1, 1873.

Direct examination by M'r Cozzens:

Int. 1. Please state your name, age, residence, and occupation.

A. Thomas J. Hillock; age, 29; residence, East Cambridge; occupation, carpenter.

Int. 2. Have you ever been employed upon any railroad, and if so, what railroad?

A. I have been employed upon the Boston and Lowell and Nashua Railroad.

Int. 3. In what capacity were you employed on that railroad?

A. I was employed as a carpenter in the car shop.

Int. 4. How long were you employed there?

A. Nearly five years.

Int. 5. What sort of work did you do in the car shop?

A. Well, it was an assortment of work; new work and repair work—both together—on passenger-cars.

1599 Int. 6. Did this sort of work make you familiar with the arrangement, repairs, and adjustment of the brakes on said cars?

A. Yes, sir.

Int. 7. Do you remember that in the early part of 1872 there was a brake known as the Springfield brake put upon certain cars on the Boston and Lowell Railroad?

A. Yes, sir.

Int. 8. Please state who did the work of putting that brake on to those cars at that time?

A. John Copithorn and myself were the men.

Int. 9. Upon how many cars of said road was said brake put?

A. Four. It was the Lowell train; consisting of a baggage-car, two passenger-cars, and a smoking-car.

Int. 10. Please state, if you know, how these brakes answered as to working well or ill.

A. I should say that they worked badly; they could never make them work at all. I worked at them pretty much all the time they were on, and we adjusted them every day.

Int. 11. Please state whether you ever went out on the train upon which those brakes were used.

A. Yes, sir; I have been on the train two or three times.

Int. 12. At these times, or any of them, did you, yourself, apply those Springfield brakes?

A. Yes, sir.

Int. 13. Please state how they worked when you so applied them—as to holding the cars.

A. I should say they held something; I can't say how much they held; they held on one truck, but they did not seem to hold on the other much, if any—not sufficiently to break up that truck.

1600 Int. 14. You say you were on that train when those brakes were used two or three times; state how many times on these occasions you applied the Springfied brakes yourself?

A. I should say at least twice each time I was on the train. The engineers, brakemen, and baggage-master complained that the brakes were not any good; so I have gone out on the train a short distance and applied the brakes, but the engine would walk off the whole train with the brakes set on three or four cars.

Int. 15. State whether at any time, when you were on this train with the Springfield brakes, anything came under your own observation in reference to the brake being applied and the train running by stations.

A. They could not stop the train by shutting off the steam at the usual places when these brakes were; applied they would generally run by the station a little ways. This came under my own observation.

Int. 16. State whether at other times than when you were on the train yourself you have heard, after the train had got in, complaints from the brakemen in respect to the holding of the brake.

A. That was a common occurrence. It was most every day that complaints were made.

Int. 17. What were the complaints?

A. The general complaint was they did not work; they could not break the trains up in time to stop at the stations.

Int. 18. You have said just above that you worked on these brakes pretty much all the time they were on and that they were adjusted every day; state who, if anybody besides yourself, worked at adjusting these Springfield brakes.

A. Well, there have been a number out there with me; John Copethorn was one who worked with me.

Int. 19. For about how long a time did you work at the adjusting of these Springfield brakes?

A. I should judge about three months.

1601 Int. 20. While you worked at the adjusting of these Springfield brakes, how many men were engaged at a time in adjusting them?

A. Two.

Int. 21. Were the two men engaged in adjusting these brakes during all the time that was allowed for adjusting them?

A. Yes, sir; and then those cars have been set off once or twice for the purpose of adjusting the brake—left out of the train one day for the purpose of being adjusted.

Int. 22. Please state how long it would take to adjust these brakes on one car; doing the adjustment as well as you could.

A. Some days we could do it quicker than others, or we would have to get through quicker on account of the car not standing in the car-house long enough. The train would come in and change cars, and we had to work on them between times, while they would be shifting. I should say it would take from half to three-quarters of an hour to adjust the brakes on one car; I have had to go over to the depot sometimes to adjust the brakes when the train was taking in its passengers.

Int. 23. How long did it take to adjust the Springfield brakes on the four cars?

A. That is, to do them properly, or to do them just according to the time we had there; which do you mean?

Int. 24. According to the time you had there.

A. From half to three-quarters of an hour.

Int. 25. About how long did the train remain in the car-house for you to adjust the brakes?

A. From half to three-quarters of an hour.

Int. 26. All this time was spent in adjusting the brakes?

A. Yes, sir.

1602 Int. 27. How much of this half to three-quarters of an hour did each of the two men work at the adjustment of the brakes?

A. All the time; it took both of us all the time.

Int. 28. And did you, then, sometimes have to follow the cars out of the car-house to do still more adjusting?

A. Yes, sir.

Int. 29. Now, will you please answer how long you think it would take to adjust the brakes of those cars, "to do them properly," as you said above?

A. I should think it would take from a' hour and a half to two hours to go over the four cars.

Int. 30. And how much of this hour and a half to two hours for the four cars would each of the two men have to be occupied in the adjusting?

A. That is the time for the two men.

Int. 31. Each would be occupied all that time?

A. Yes, sir.

Int. 32. Please state how much care had to be taken with those Springfield brakes in adjusting them?

A. We were as particular as that we had to take our rule and measure both ends of our lever so we would have both rods of exact length.

Int. 33. Doing this, how equal were you able to get the adjustment as between the two trucks of the car?

A. We could get them equal; that is, in the position the cars stood in when standing still; but when the car would move both trucks were inclined to go backwards, so it threw the hind brake nigher to the wheel.

Int. 34. State what effect that had on the adjustment or on the equality of the power of the brakes on the two trucks?

A. It had this effect, that when you broke up on the lever they were not equalized so that the brakes of both trucks would brake together; that is, give the same power on the wheels of both ends of the car.

Int. 35. Were you able to overcome this difficulty?

1603 A. No, sir.

Int. 36. How hard did you try to overcome it, and to adjust the brakes so they would work well?

A. We used all the possible means we could use to overcome it.

Int. 37. State whether or not you were familiar with the business of adjusting car-brakes at the time you were set to work to adjust those Springfield brakes.

A. We had been accustomed to the Hodge brake. In adjusting the Springfield brakes, we went according to the directions of the foreman, M'r Benjamin C. Read, and there was also another gentleman, M'r Whipple, who came there occasionally. He was there at times I when made alterations in the arrangement of the brakes, also in the leverage of the brakes.

Int. 38. Why were these alterations in the arrangement and leverage of the brakes made?

A. To give the brake more power on the wheels, I should say—to give it more leverage. They altered the hole where it hauled from the centre.

Int. 39. State from whom these directions about the alterations in the arrangement and leverage of the brakes came.

A. M'r Whipple.

Int. 40. Were you present at any time when M'r Whipple gave any directions about these matters?

A. Yes, sir; there was one place—in the paint-shop—where we were making the alterations. I was there when the directions were given by M'r Whipple at that time.

Int. 41. Did M'r Whipple ever give you any directions about how to adjust the brakes?

A. Yes, sir.

Int. 42. About how frequently did he do this?

A. One time was the time we made the alterations; there was another time over at the Boston & Lowell depot.

1604 Int. 43. Do you remember that while those brakes were on the cars there was a week when they were making a test of them?

A. I think I do.

Int. 44. During that week how hard did you try, in adjusting the brakes, to make them work well?

A. We were particular in setting the rods, to have each brake have the same bearing on the wheels. We lengthened and shortened the rods by the rule so that each rod was the same length.

Int. 45. Are you still employed on the Boston and Lowell Railroad; if not, when did you leave there?

A. I am not. I left there in June, 1872.

Int. 46. Please state why you left.

A. I should say I left on account of not liking the work.

Int. 47. At the time you left the Lowell road, how many cars of the kind which usually have double-acting brakes upon them, namely, passenger-cars, baggage, mail, and express cars, and smoking-car, did the Boston and Lowell Company own?

A. There were 62 cars.

Int. 48. How many hours constituted a working-day on the Lowell road at the time you left?

A. Ten hours.

Int. 49. Suppose all of these 62 cars had on them Springfield brakes like those which were on the four cars above referred to—how many men working ten hours a day each, would it, in your judgment, take to keep the 62 Springfield brakes in such a state of adjustment as they ought to be in to run?

A. From five to six men.

1605 Int. 50. What are the average wages per day which the men who adjust the brakes on the Lowell road receive?

A. $2.75.

THOMAS J. HILLOCK.

(No cross-examination.)

Deposition of Jerry Peron, recalled on behalf of complainant. Taken at Providence, May 5, 1873.

Int. 1. Please state who adjusted the Springfield brakes at the time of the experiment made with it by M'r S. M. Whipple on the car on the Providence and Worcester Railroad on the 29th of March, 1873.

A. I did.

Int. 2. Please state whether M'r Whipple at this time gave you any directions as to adjusting it; and, if so, what were the directions?

A. Yes, sir; he told me to adjust it as nicely as I could.

Int. 3. How nicely or carefully did you adjust it?

A. I have had considerable experience in adjusting brakes—have been adjusting them a good while, and I adjusted this Springfield brake as perfectly as I could. When I got through there wasn't an eight of an inch difference between the eight shoes on the different wheels. That is about as close as you can get it.

Int. 4. State whether M'r Whipple was present while you were adjusting this brake.

A. He was, sir.

Int. 5. State whether, while you were adjusting this Springfield brake, M'r Whipple gave you any instructions about how to adjust it.

1606 A. Yes, sir; he told me how to do it—that is, to do it as carefully as I could; but he stood by me all the time.

Int. 6. After you had got the brake adjusted, what adjustment or regulation, if any, did you make as to the scales which were above the floor of the car?

A. We had the turnbuckle, and we adjusted the scales until they balanced, pound for pound. They were exactly alike at each end of the car. I looked at them before the car went out, and saw that everything was all right.

Int. 7. Please state about what distance this car with this Springfield brake on it thus adjusted, traveled from the place where you adjusted the brake to the bridge just at the end of the railroad-yard in Providence.

A. Just about a quarter of a mile, I should think.

JERRY PERON.

(No cross-examination.)

Subscribed before me this fifth day of May, A. D. 1873.

FRANCIS A. DANIELS,
U. S. Comm'r.

Deposition of Benjamin F. George, recalled for complainant. Taken at Boston, May 2, 1873.

Int. 1. Will you state the grades on the main of the Boston and Lowell Railroad line between Boston and Lowell?

A. There is no grade exceeding 25 feet to the mile.

Int. 2. How long is this heaviest grade of 25 feet to the mile?

1607 A. I cannot state the exact length, but it is only a short distance.

BENJ. F. GEORGE.

Deposition of Samuel B. Cushing, called on behalf of the complainant. Taken at Providence May 5, 1873.

Int. 1. Please state the radius of the "Eaton curve," so called, on the Providence and Worcester Railroad; of how many degrees it is, and which way it curves going from Providence to Worcester.

A. The "Eaton curve" is a four-degree curve, of fourteen hundred and thirty-two feet radius, and curves toward the right as you go from Providence to Worcester.

Int. 2. Assuming that upon curves upon a railroad chord-lines of thirty-five feet in length for each curve are measured, and that from the middle of these chord-lines to the rails of the respective curves lines at right angles with the chord-lines are measured, making the versed series of such curves respectively ten inches and six inches, what will be the radii in feet of such curves respectively?

A. The radius of the curve of which the versed line is ten inches will be one hundred and eighty-four (184) feet, and the radius of the curve of which the versed line is six inches will be three hundred and six (306) feet.

SAM'L B. CUSHING.

Subscribed before me this fifth day of May, A. D. 1873.

FRANCIS A. DANIELS,
U. S. Comm'r.

1608 *Deposition of Thomas Sayles, the complainant, recalled on his own behalf.*

Examined by M'r Cozzens:

Int. 1. State whether you have learned anything in relation to the Springfield brakes which have recently been upon certain cars of the Boston and Albany Railroad; if so, please state where you learned it, and what you learned.

A. I have; I saw from my own observation a few days ago that the

Springfield brake, which has recently been on car No. 124, on said railroad, had been takan off and the Hodge brake put in its place. I further learned to-day from the master car-builder at the shops of said company that the Springfield brake had also been taken off of the post-office car and the baggage-car of the train which formerly had on the Springfield brake, and that Hodge brakes had been put on in their places. I have also learned at the depot of the said company that the Springfield brakes were to be taken off of all the remainder of said cars and the Hodge brakes put on.

Int. 2. Please state whether you were present at the test of the Springfield brake upon a passenger-car on the New Jersey Railroad at Jersey City, about which M'r Charles Watts and M'r David H. Baker have heretofore testified in this case; and, if so, please state how such test come to be made and what you saw take place at said test.

A. I was present when said test spoken of was made. I asked the superintendent of the road to run the car out in a train to Newark and have the brake tried on the curve near Newark. He told me he would have the car run out and wished me to go out and see it tried. He told M'r Watts, who was depot-master there, to put that car into the 1609 train and run it out to Newark and try the brake. M'r Watts and I went out where the car was in order to attach it to the train that was about ready to start for Newark, and found that we hadn't time to get the car into that train. While we were standing there near the car, an engine backed down to hitch on to this car that had the Springfield brake on to attach it to some other train, and M'r Watts asked if we could not try it on a curve of the same track on which the car then stood. I told him I thought he could, but not so well as on the curve near Newark, for the curve, I didn't think, was so short as the Newark curve in the main line of the road. The engine was hitched to the car, and he then asked a man who stood on the car to apply the brakes while the car was being drawn from where it had been standing on the straight track. Before the engine was hitched to the car at this time at Jersey City, I had tried the brakes of the car and found that they were so nicely adjusted that I could not tell which truck they were applied to the hardest. The brake was applied while being drawn on the straight track before it reached the curve and the brakes set with the ratchet, not hard enough to slide any of the wheels. After the ratchet was set the car was drawn on the curve. When it commenced going on the curve one pair of wheels in the forward truck commenced sliding, and very soon the other pair of wheels commenced sliding. The engine drew the car on the curve until both trucks were fairly on the curve. All of the wheels of the forward truck were sliding when the car stopped. I then went to the rear truck and put my foot against one of the brake-beams, and found the brakes loose on the rear truck.

Int. 3. Please state whether the said Springfield brake on the car at Jersey City was arranged like either of the models put in evidence by the defendants in this case and marked "Springfield Brake Nos. 1, 2, and 3"; and, if so, which one was it like?

1610 A. It was put on similar to the brake on "Model Springfield Brake No. 1."

Int. 4. Please state whether any notice has been given to M'r S. M. Whipple, representing the defendants in this case, of taking of the testimony which has been taken on your behalf at New York on the 25th of April, 1873, and at Boston on and since the 26th of April, 1873.

A. I personally give M'r Whipple notice in Boston on the 23d of

April, 1873, that unless the defendants' time for taking testimony upon this accounting should be extended by the court beyond the 23d instant, I should take testimony in New York on the 25th and in Boston on the 26th instant. M'r Whipple at that time agreed to attend upon such notice. M'r Whipple and I then went to New York, and, after learning on the 24th that the defendants' time had not been extended, I again gave M'r Whipple notice in New York that I should take testimony in New York on the 25th and in Boston on the 26th of April, and I also subsequently caused notice to *to* the same effect to be sent to him in New York.

Int. 5. Also please state whether notice was given to said Whipple of the taking of the testimony which has been taken herein on your behalf in the city of New York on and subsequent to May 1, 1873, as appears by this accounting record.

A. I caused due written notice to be sent to M'r Whipple of the taking of the testimony inquired about in this question. It was so sent in abundant time to enable him to attend the taking of it, and he was in the city of New York at the time. On the evening of the first day of May, 1873, I saw him at the Astor House, and he then acknowledged to me that he had received the notice on the 29th day of April, 1873.

T. SAYLES.

1611 United States circuit court, northern district of Illinois.

THO'S SAYLES
vs.
C. & N. W. R'Y CO. } In chancery.

It is hereby stipulated between the parties to the above-entitled cause for the purpose of the hearing on complainant's claim for damages, that said defendants became a corporation and commenced running its cars and doing business on a portion of its railroad on the second day of June, 1859, and from that time until June 2d, '64, used on all of its passenger trains on its said road double-acting car-brakes known as the Stevens pat. brake; that such brakes were used on thirty-six (36) eight-wheeled cars running in its passenger trains, including all its passenger, baggage, and express cars. That it run four trains each day, and six cars in each train on an average. That during said 1612 period said defendants run a mixed train daily for freight and passengers, between Janesville and Chicago, being about ninety (90) miles, on which there was usually one passenger-car and one baggage, and that for one year during said period a similar train was run between Harvard and Rockford, the distance being about twenty-eight (28) miles, and that the baggage men on said two trains worked the brakes on said passenger and baggage cars. If extra passenger-cars were run the conductors of said trains acted as brakesmen on the extra cars. The remainder of said thirty-six (36) cars were in the shops for repairs or held in readiness for extra occasions. That each of said trains of six cars required and had two brakemen besides the baggage-man, who acted as brakeman on all of said trains. That defendant paid its brakemen an average of thirty-four dollars and forty cents ($34.40 c'ts) per month during said period of five years.

That during said period the actual cost of thirty-three-inch wheels, such as were used under the said thirty-six cars, was sixteen dollars and seventy cents ($16.70-100) each wheel, and that the cost of taking off old wheels and putting new wheels on the axles, was one dollar each wheel.

That on the 2d day of June, 1864, said def. consolidated its railroad and corporate franchises with the railroad and corporate franchises of the Galena and Chicago Union R. R. Co.; and the new consolidated company retained the corporate name of the def'ts.

WEST & BOND,
Soli. for Comp't.
(Signed) H. W. BLODGETT,
Def'ts' Att'y.

1613 U. S. circuit court, northern dist. of Illinois.

THOMAS SAYLES
vs.
THE C. & N. W. R. W. Co. } In chancery.

It is hereby stipulated between the parties to this cause, by their respective counsel, as follows:

First. That the stipulation made herein between said parties, on the twentieth day of March, 1867, in reference to the number of brakemen employed by the above-named defendants be amended, and it is now hereby stipulated that during all the time between the second day of June, 1859, and the second day of June, 1864, the said defendants employed on their railroad within said district, twelve regular brakemen for their passenger trains, besides the baggage-men on said passenger-trains, who also acted as brakemen.

Second. That during all said time, between the second day of June, 1859, and the second day of June, 1864, the said defendants used on their said railroad, at least two "way" or "caboose" cars, in their various freight trains, each of which cars had upon it a "Stevens'" double-acting car-brake.

Third. That during all said time, between the second day of June, 1859, and the second day of June, 1864, the said defendants removed the wheels of the thirty-six cars run in passenger-trains on their said railroad, as per former stipulation, as often as once or twice a year, sometimes oftener, on account of flat spots, which rendered them unfit for passenger-cars. Most of said wheels were then put under freight cars—under the end of said freight cars that had no brake on.

Dated May 10th, 1873.

WEST & BOND,
Comp't's Solicitors.
J. N. JEWETT,
Defe'ts' Solicitor.

1613½ THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company. } In chancery.

Exhibit No. 8 in Supreme Court record.

W'M H. BRADLEY, *Clerk*

1614 United States circuit court for the northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In equity.

TESTIMONY TAKEN UPON THE ACCOUNTING IN THE CASE BEFORE H. W. BISHOP, ESQUIRE, MASTER IN CHANCERY.

S. D. Cozzens, of New York, counsel for complainant; S. M. Whipple, J. N. Jewett, of Chicago, counsel for defendants.

Filed May 19, 1873.

W'M H. BRADLEY, *Cl'k.*

1615 *Testimony on behalf of the complainant.*

Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company. } In chancery.

JULY 19TH, 1871.

ASAHEL EMIGH, having been first duly sworn, was examined in chief by M'r Cozzens, and testified as follows, to wit:

Q. 1. What is your name, age, residence, and business?

A. Asahel Emigh; my age is 46; residence New York City; occupation real estate and patent rights.

Q. 2. In what way as to patent rights?

A. Owner and manager of a number of patent rights?

1616 Q. 3. Are you familiar with the letters patent granted July 6th, 1852, to Henry Tanner, as assignee of L. F. Thompson and A. G. Bachelder, for an improvement in car-brakes, and with the invention described therein?

A. I am familiar with the said patent and invention.

Q. 4. How long have you been so familiar with them?

A. About 16 years.

Q. 5. Will you please state upon what railroads, to your knowledge, the form of brake represented in the drawings of that patent, and technically known as the "Tanner brake," is or recently has been in general use, and upon what railroads is it in partial use?

A. It is in general use on the Camden and Amboy Railroad in the State of New Jersey; by the New Jersey Railroad and Transportation Company; it is in use on the Jamestown Road, and the Belvidere Road, both in the State of New Jersey; also in general use on a very large number of cars on the Pennsylvania Railroad; and in general use on the Louisville and Nashville Railroad; and in partial use on the Hudson River Railroad, on the Pittsburgh, Fort Wayne and Chicago Railroad, and on a few cars on the Chicago, Burlington and Quincy Railroad.

Q. 6. State, if you know, what is the fact as to the Tanner form of brake being in general use upon most of the railroads of the southern States?

A. The last time I was there, some years ago, I found it in quite general use; used on quite a large number of cars.

Q. 7. State whether you are interested in and managing the Stevens patent for a railroad-car brake?

A. Yes, sir.

1617 Q. 8. Have any of the railroads which use the Tanner brake, licenses under the Stevens patent?

A. A number of them have.

Q. 9. Please state as to whether you had knowledge, in or about the year 1862, as to the use of the Tanner brake upon railroads in the United States?

A. Previous to and at that time I knew of its general use upon the Providence, Hartford and Fishkill Railroad; the Camden and Amboy, the Providence and Stonington, the New Jersey Railroad and Transportation Company, the Jamestown Railroad, the Belvidere Railroad, the Lehigh Valley Railroad, the Augusta and Savannah Railroad, the Georgia Central, the Montgomery and Florida Railroad, the Mobile and Girard Railroad Company, the New Haven, Hartford and Springfield; and partially in use on the Providence and Worcester Railroad, and on the Boston and Providence Railroad, on the Long Island Railroad, the North Pennsylvania Railroad, the Pennsylvania Railroad, the Germantown and Norristown Railroad, the Richmond and Fredericksburg Railroad, the Wilmington and Manchester Railroad, the Selma and Alabama Railroad, the Reading Railroad, the Hudson River Railroad, the New York and Erie Railroad, the Buffalo and New York City Railroad, and the Elmira, Canandaigua and Niagara Falls Railroad.

Q. 10. State whether there are any of these roads mentioned in your last answer which you haven't visited since the last part of 1862?

A. I have not visited any of the roads mentioned in my last answer, south of the States of Kentucky and Virginia.

Q. 11. Any others?

A. Well, some of the roads in New England I have not visited nor examined since that date.

Q. 12. State, also, whether there are any of these roads enumerated in said answer which you have visited since 1862, respecting which it is not within your knowledge at the present moment what form of brake they use?

1618 A. I have a general knowledge of the brakes in use on all the roads which I have visited since that date; that is, as to the brake used at that time or soon after that time whenever I visited the roads up to the present. What they may use to day, I don't know. I know what they used very recently.

Q. 13. For about how many years have you been in the habit of visiting railroads with reference to car-brakes?

A. About 18 years.

Q. 14. According to your best observations during, say the last few years, how is the fact as to whether the use of the Tanner form of brake—the centre lever—has diminished or increased?

A. It has increased in its use for the last ten years.

Cross-examination by Mr. Jewett:

Cross-q. 1. Is or is not, the Tanner form of brake being superseded by other and better forms of brake?

A. It has been in many instances.

Cross q. 2. Is it as much in use now as formerly, in proportion to the extent of railroads; in proportion to the number of roads actually using brakes, is it as much now in use proportionally as it was formerly?

A. I think it is, in proportion to what it was ten years ago.

Cross-q. 3. I asked if it was as much in use now, in proportion to the number of roads actually using railroad car brakes, as it formerly was?

A. I think it is nearly as much as it was, in proportion, as it was at the time I first became acquainted with car brakes.

Cross-q. 4. The facts are, it has increased?

A. I think so; so far as my knowledge goes, it is used now ten times as much as it was ten years ago.

1619 Cross-q. 5. Is it used much, if at all, in the West?

A. It is used somewhat in the West; partially used on some roads, and wholly used, I think, on others.

Cross-q. 6. Is it used on any of the roads coming into Chicago?

A. It is in partial use on the Pittsburgh, Fort Wayne & Chicago road, or has been within the last two or three years; and it is used on a few cars on the Chicago, Burlington & Quincy Railroad, and on a number of roads running through Indiana and the southern portion of Illinois.

Redirect examination by M'r Cozzens:

Redirect q. 1. Do you happen to know whether it is in use on any of the through first-class express trains on the New York and Washington lines?

A. It is used on a large number of cars known as the through line going between New York and Washington—on the fast express trains between the two cities.

Redirect q. 2. State whether these trains are large, heavy, first-class trains?

A. They are large, heavy, first-class cars, and run at high rates of speed.

Redirect q. 3. Have or had any of the railroads over which the Washington lines run licenses under the Stevens patent during either the first term or the extension of that patent?

A. The Philadelphia, Wilmington & Baltimore Railroad Company have a license under the first term of the Stevens patent, that being one of the roads over which the through lines between New York and Washington runs. The other roads have no licenses.

Redirect q. 4. How long is the Philadelphia, Wilmington & Baltimore Railroad, and is it a first-class road?

1620 A. It is about ninety-eight miles long. It is a main line, and I consider it a first-class road.

Redirect q. 5. Please state, if you know, whether the Illinois Central Railroad Company has a license under the Stevens car-brake patent; and, if so, how long has it had such license?

A. About four weeks since, at the request of M'r Stevens, the patentee of the said patent, I called at the office of John Newell, the president of the Illinois Central Railroad Company, for the purpose of ascertaining what kind of a license, if any, said railroad company had under said Stevens patent. M'r Newell showed me their book of record containing patent licenses, and pointed out to me their record of the Stevens license in said book to their company. It was a full license for the first term of the Stevens patent, and for any and all extensions. It was dated about the year 1854.

Redirect q. 6. Please state what car brake is now in general use on the Illinois Central Railroad, if you know.

A. The Hodge brake.

Redirect q. 7. Please state to what extent, to your knowledge, the Hodge brake is now used in the United States.

A. It is in general use in the New England States and in the State of Ohio, and on many roads in the State of Indiana and in the State of Iowa, in the State of Missouri, and on the Union Pacific Railroad, and on a number of roads in the State of New York and the State of Illinois and the State of Michigan.

Redirect 8. Will you give some idea of about how long it has been in use in the parts of the United States mentioned?

A. As a general thing, since it was first introduced—say about eighteen fifty-four to the New England and Eastern States, and somewhat later in the Western States.

A. EMIGH.

1621 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILROAD Company.
} In chancery.

JULY 20, 1871.

C. C. KELLOGG, being duly sworn, was examined in chief by M'r Sayles, and testified as follows:

Q. 1. State your name, age, residence, and occupation.

A. C. C. Kellogg; age, 38; residence, Chicago; secretary of the Barnum-Richardson Manufacturing Company.

Q. 2. Do your company manufacture railroad-car wheels?

A. Yes, sir; we have manufactured railroad-car wheels since 1862.

Q. 3. Did your company sell wheels to the Northwestern Railroad Company from 1862 to 1864, and did they buy old wheels of the company during that period?

A. They did.

1622 Q. 4. When you charged for new wheels from $16 to $18 each, what did you pay them for the old wheels?

A. From November, 1862, to December, 1863, we allowed the Chicago and Northwestern Railroad a cent and one-half per pound for old wheels. During that time the price for new wheels was from $15 to $18 each—thirty-three inch wheels.

Q. 5. Have you memoranda with you, taken from your books, of the price of the wheels?

A. Yes, sir.

Q. 6. During the period mentioned, when you charged them eighteen dollars apiece for wheels, in December, 1863, what did you allow them for old wheels?

A. One and one-half cents per pound.

Cross-examined by M'r Jewett:

Cross-q. 7. What is the usual weight of car wheels the size you mentioned?

A. Our wheels weigh from five hundred and five to five hundred and ten or fifteen pounds. They average about five hundred to five hundred and ten.

C. C. KELLOGG.

Subscribed and sworn to before me this 20th day of July, 1871.

H. W. BISHOP,
Master, &c.

1623 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILroad Company.
} In chancery.

JULY 26, 1871.

Testimony of HENRY TANNER, called by complainant:

Q. 1. Please state your name, age, residence, and occupation.

A. Henry Tanner; age, 58; residence, Buffalo, N. Y.; occupation, general trader.

Q. 2. Are you the person to whom the letters patent known as the Tanner car-brake patent were issued as assignee on July 6th, 1852?

A. I am.

Q. 3. Have you at the present time any interest in that patent?

A. No.

Q. 4. Did you ever give any personal attention to the subject of railroad car-brakes, and to the introduction upon railroads in the United States of double-acting brakes for cars; if yea, when did you
1624 first give these matters attention, and for how long a period did you continue to be occupied with them?

A. I did, commencing in 1847, and ending, I think, in 1854. I devoted about all my time to that business.

Q. 5. State whether, during a part of this time, and, if so, for how much, you were engaged in introducing upon railroads in the United States double-acting car-brakes involving the invention patented in the said Tanner car-brake patent?

A. Well, about all the time; about all this time I was engaged in introducing that brake, or a brake in which that invention was involved.

Q. 6. While thus engaged, what portion of the railroads of the United States, if any, did you visit upon this business?

A. Well, I should say equal to three-quarters of what then existed in what we knew as the Northern States, outside of the slave States.

Q. 7. When you first went about to introduce the double-acting brake, what kind of brakes did you find in use upon the cars of the railroads you visited?

A. What is called the single brake, applying from the windlass to one truck.

Q. 8. State what you found, from your personal experience during this period of about seven years that you were engaged in introducing the double-acting brake upon these various railroads, to be the advantages which were derived by these railroads from its use, in respect of the number of brakemen necessary with it, as compared with the number necessary with the old single brake?

A. It did away with one-half the brakemen. It was almost universally so conceded at that time by railroad men in their statements to me about it.

Q. 9. How did you derive this knowledge and these acknowledgments that it did away with one-half the brakemen?

A. In the course of my business of introducing it and negotiating for the payment for it.

1625 Q. 10. At the time you commenced to introduce the double-acting brake, what was the average rate of speed of passenger-trains on railroads in the United States?

A. To the best of my recollection, about fifteen to twenty miles an hour when in motion.

Q. 11. About what, as nearly as may be, was the weight and length of passenger-cars then as compared with passenger-cars of the present time?

A. Well, I should judge they were double the heft now that they were then.

Q. 12. About what was the average weight of locomotives for passenger-trains at the time you commenced introducing the double-acting brakes?

A. Well, I should judge from ten to twelve tons.

(Cross-examination waived.)

HENRY TANNER.

Subscribed and sworn to this 26th day of July, 1871.

H. W. BISHOP,
Master, &c.

1626 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILROAD Company.
} In chancery.

JULY 27, 1871.

HENRY MORRIS, having been first duly sworn, was examined in chief by S. D. Cozzens, esq., and testified as follows, to wit:

Q. 1. Please state your name, age, residence, and occupation.

A. Henry Morris; 35 years; Janesville, Wisconsin; locomotive engineer.

Q. 2. How long have you been employed as a locomotive engineer, and on what railroads?

A. About eleven years; on the Northwestern Railroad—on the Wisconsin division.

Q. 3. Please state, if you know, at what rates of speed the passenger-trains ran on that road from 1859 to June, 1864.

A. From twenty to twenty-two miles an hour; that included stops.

Q. 4. What was the speed of running-time of those trains?

A. About from twenty-four to twenty-five miles an hour.

1627 Q. 5. What was the weight of the engines attached to these trains during that time—the average weight?

A. From twenty-six to twenty-eight tons.

Q. 6. How many stations at which passenger trains stop were there on the Wisconsin Division of the Northwestern Railroad, between 1859 and June, 1864?

A. I can tell you the number from Chicago to Oshkosh, but not beyond there; there were thirty stations from Chicago to Oshkosh, at that time, at which passenger trains stopped.

Q. 7. What is the distance on the railroad from Chicago to Oshkosh?

A. One hundred and ninety-three miles.

(Cross-examination waived.)

HENRY MORRIS.

Subscribed and sworn to this 27th day of July, 1871.

H. W. BISHOP,
Master, &c.

1628 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILROAD Company.
} In chancery.

JULY 27TH, 1871.

Examination of W'm T. Ragland:

Q. 1. What is your name, age, residence, and business?

A. William T. Ragland; age, 55; residence, Bloomington, Illinois; occupation, machinist.

Q. 2. Have you ever been employed upon railroads; and, if so, please state upon what railroads, and about when you first commenced to be so employed?

A. I have been employed on different railroads: the Hudson River; Albany & Schenectady; Chicago & S't Louis; Bloomington & Alton Railroad—I built that road. I commenced to be employed on railroads somewhere about 1841 or 1842.

Q. 3. In what capacity or capacities were you employed on these railroads?

1629 A. On the Hudson River Railroad I had the superintending of the building and repairing of all the cars. On the S't Louis road, I was the superintendent of machinery, of the engines and cars—all the rolling stock.

Q. 4. For about how many years in all did you continue to be employed upon the various railroads mentioned?

A. Somewheres in the neighborhood of 26 years.

Q. 5. State whether your experience on the railroads which you have mentioned has made you acquainted practically with the different kinds of car-brakes used on railroad cars in the United States; if so, state what are some of the different forms of car brakes with the use of which you are practically acquainted?

A. I have become practically acquainted with the car-brakes used in the United States—those that are in general use.

First among the number is the brake known as the single hand brake operating on four wheels; the next is the Tanner brake, operating on eight wheels from either end of the car; the next is known as the Hodge brake, operating on eight wheels of the car from either end of the car; the next is the Stevens brake, also operating on eight wheels from either end of the car.

Those are the four that I am most familiar with in practical use.

Q. 6. Please state for about how long you have been familiar practically with these various forms of brake?

A. I am acquainted with the single hand brake operating on four wheels since I first went in the employ of the railroad companies in 1842, or about that. I became acquainted with the Tanner, Hodge, and Stevens brakes about the years 1850 to 1852. I have been acquainted with them from that time to the present.

1630 Q. 7. While you were employed on the Hudson River Railroad, were you ever at any time called upon to make any practical comparative tests between the old single acting brake and the Tanner and Hodge brakes in reference to the wear and durability of the car-wheels of cars with the said brakes respectively; and, if yea, state about when you made those tests and upon what kind of cars the tests were made?

A. Yes, I did make some tests. I think it was in the spring of 1852. I made the tests upon passenger, baggage, and mail cars.

Q. 8. For about how many months did those tests continue?

A. During that summer. Probably four months. I should say about four months.

Q. 9. Were said tests under your charge and direction during the whole of this time?

A. They were under my direction.

Q. 10. Did any person request or instruct you to make those tests, and, if so, who?

A. They were made at the suggestion of the superintendent of the road.

Q. 11. State how you found the fact to be from those tests as to whether the car-wheels would last longer without injury when the Tanner brake was used on the cars than when the old single acting brake was used on the cars?

A. They lasted longer with the Tanner brake than with the old single brake.

Q. 12. Now, from the experience and knowledge derived by you from those tests, how many more sets of eight wheels for a passenger car would be required in a year with the old fashioned single brake on the car, than upon the same car in a year with the Tanner brake, assuming that the cars were of the ordinary weight, and that the speed at which they were run would be twenty miles per hour including stops?

A. Four sets of wheels with the single brake to one set with
1631 Tanner brake. I am basing this answer on the tests I made. In
other words, I mean that with the single brake three sets of wheels more would be required on a passenger car in a year than would be required on the same car in the same time with the Tanner brake. A set of eight wheels under a passenger car under the circumstances assumed would last about a year.

Q. 13. State whether you found in the tests mentioned any essential difference between the durability of the wheels when the Tanner form of double brake was used and when the Hodge form was used.

A. There was no material difference in the wear of wheels between either of those brakes, the Tanner and the Hodge.

Q. 14. Will you please state what are the reasons why the wheels last so much longer when the Tanner brake is used than they do when the single brake is used?

A. The difference is in the construction of the two brakes. With the old single brake all the force exerted on the windlass is applied to the pair of brake-clogs that connects with the fulcrum of the lever, thereby exerting a force sufficient to stop the rotation of the wheels, causing a flat spot to be worn on the outer periphery, thereby making the wheels unsafe for passenger-cars. With the Tanner brake, the lever is so arranged that the power is more equally divided up between the eight wheels under the car, and does not produce the effect of sliding the wheels to so great an extent.

Q. 15. State whether the passenger-car wheels slide somewhat when the Stevens brake is used.

A. Not where the levers are properly arranged, and no more force exerted than one ordinary man is capable of doing. As the Stevens brake is ordinarily arranged, the wheels do sometimes slide.

1632 Cross-examined by M'r Jewett:

Cross-q. 1. Which is the better brake, the Stevens or the Tanner?

A. I think the Stevens brake is the best brake.

Cross-q. 2. Which is the better brake, the Tanner or the Hodge brake?

A. I don't think there is any material difference between them two brakes.

Cross-q. 3. Which brake did you adopt after the tests you referred to?

A. The Stevens brake.

Cross-q. 4. Where were those tests made?

A. On the Hudson River Railroad.

Cross-q. 5. At what place on the road were they originated?

A. At Thirty-first street, corner of Tenth avenue, at the shops in New York City—at the shops of the company.

Cross-q. 6. Who assisted in making them?

A. Several men. I don't remember their names.

Cross-q. 7. Who was the superintendent of this road who ordered the tests?

A. Oliver H. Lee.

Cross-q. 8. Where is he now?

A. I think he is somewhere in Chicago—I would not be positive. I meet him here once in a while. I believe he has gone out of the railroad business altogether.

W'M T. RAGLAND.

Sworn to and subscribed this 27th day of July, A. D. 1871.

H. W. BISHOP,
Master in Chancery.

1633 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILROAD Company.
} In chancery.

JULY 29, 1871.

WILLIAM GUNTHER, being first duly sworn, was examined in chief by S. D. Cozzens, esq., and testified as follows:

Q. 1. What is your name, age, business, and place of residence?

A. William Gunther; age 39; car-repairing; residence, Chicago.

Q. 2. Are you employed upon any railroad; and, if so, upon what railroad?

A. I am—on the Wisconsin division of the Chicago and Northwestern Railroad.

Q. 3. Do you have anything to do with looking after the wheels of the passenger-cars on that railroad; if so, what do you have to do about the wheels?

A. I do; I look the wheels over.

Q. 4. How often do you look the wheels over?

A. Every time the cars come in.

Q. 5. Do you have a gang of men under you doing this work of inspecting the car-wheels?

A. Yes, sir.

1634 Q. 6. How many men are there in that gang; and who is the foreman of the gang?

A. There are four men, and I am the foreman of that gang.

Q. 7. How often, on the average, do you have to remove the car-wheels from under the passenger-cars on said Wisconsin division ?

A. Every four months, about, on an average.

Q. 8. What is the matter with the wheels which causes you to remove them thus often ?

A. They get "spotted."

Q. 9. After they get "spotted," are they considered unfit to run in passenger-trains?

A. Well, they are not fit to run.

Q. 10. How long have you been employed on the Wisconsin division of the Northwestern Railroad, looking after car-wheels ?

A. Eleven years.

Q. 11. You were looking after car-wheels on that division, were you, between 1859 and 1864 ?

A. Yes, sir.

Q. 12. State whether there was any difference about the "spotting" of the wheels on that division between the time from 1859 to 1864, and the present time.

A. Well, I don't think there was much difference.

(Cross-examination waived.)

WILLIAM GUNTHER.

Subscribed and sworn to this 29th day of July, 1871.

H. W. BISHOP,
Master, &c.

1635 U. S. circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILROAD Company.
} In equity.

Testimony upon final accounting before the master, taken in the city of New York, in pursuance of agreement between the counsel for the respective parties above named, this fifth day of September, A. D. 1871, as follows:

SAMUEL THOMAS, a witness duly called and sworn on the part of Thomas Sayles, the above-named complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation ?

A. Samuel Thomas; I am forty years of age; residence is Jersey City; and my occupation is that of a car-inspector.

2. Q. What cars, or what trains of cars, do you inspect ?

A. I inspect all the cars of the New Jersey R. R. Co., and of the Camden and Amboy R. R., which come into Jersey City—except the cars of the Washington line.

1636 3. Q. For about how long have you been employed in inspecting the cars you have above referred to ?

A. Since 1853, off and on, and for the last eleven years all the time.

4. Q. Did you, at any time, have charge of inspecting the cars of the Washington line; if so, at what time was it ?

A. I had charge previous to M'r Van Doren taking it.

5. Q. For about how many years did you have charge of inspecting the cars of the Washington line ?

A. I couldn't state exactly, but it was two years certainly, perhaps longer.

6. Q. During the time you inspected the cars of the Washington line, what were the kinds of double-acting brakes which were on the cars of that line?

A. They were such as they are using now on the Camden & Amboy cars and the New Jersey cars; and we had on some of the Philadelphia, Wilmington & Baltimore cars a brake with a long rod running through from one truck to the other.

7. Q. In inspecting these cars of the Washington line, what were your duties—what did you have to do to the cars?

A. I had to see that the cars were all in right order to run—the wheels and brakes.

8. Q. State whether you had to take out the wheels when they were worn too much to run properly, and put others in their place.

A. I had to notify M'r Baker or M'r Brown.

9. Q. Notify them about what?

A. That they wanted a new pair of wheels.

10. Q. When you so notified M'r Baker or M'r Brown, what did they do?

A. They sent men to take them out and put new ones in.

11. Q. While you had charge of inspecting the cars of the Washington line, did you, or not, find any difference in the length of time the
1637 wheels would wear in the cars of that line furnished by the Philadelphia, Wilmington and Baltimore road, having the brake with the long rod running from one truck to the other, of which you have spoken, and the cars of the Camden and Amboy and the New Jersey roads running in that line?

A. Well, I think the wheels of the New Jersey cars will wear better than the Camden and Amboy wheels. I don't know as I could say about the difference between the cars of the Philadelphia, Baltimore and Wilmington road, and the cars of the New Jersey and Camden and Amboy roads.

12. Q. State whether or not you were able to see any difference in the wear of the wheels of the Philadelphia, Wilmington and Baltimore cars, and of the cars of the New Jersey road in that line.

A. I don't think I could see any difference.

13. Q. About how long, on an average, did you find that the wheels of the New Jersey cars in that line would last to run properly?

A. Well, I think the wheels would run about a year on an average; sometimes they would run longer and sometimes shorter, but about a year on an average.

Cross-examination by S. M. Whipple, esq.:

1. Cross-q. Is there any difference between the brakes on the Camden and Amboy cars and the New Jersey cars?

A. The connections are the same.

2. Cross-q. Has the brake in both cases a center lever connection?

3. Cross-q. Have you kept any account, or have you any facts, by which you are enabled to say that the wheels last as well on the cars of the New Jersey road as those on the cars of the Philadelphia, Wilmington and Baltimore road?

A. I haven't kept any account of them.

1638 4. Cross-q. By what method do you come to the conclusion that the wheels on the New Jersey road and Camden and Amboy last about a year?

A. I judge from about the time the cars come out of the shop with new wheels.

5. Cross-q. Have you made a minute of the time said cars came out with said new wheels, and also the time that such wheels were worn out and had to be replaced with new ones?

A. Well, I have frequently asked the boss painter when such cars came out, and he has told me a year, and sometimes a little over a year.

SAMUEL THOMAS.

JOHN P. VAN DOREN, being duly called and sworn on the part of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. John P. Van Doren; age, forty-six; residence, 223 South Eighth street, Jersey City; occupation, car-inspector for the New York and Washington air-line at Jersey City.

2. Q. How long have you been car-inspector for that line?

A. I have worked on that line more or less since it run in there, but I have been hired and paid by the line, separately, since a year ago last February.

3. Q. What are your duties as car-inspector of that line?

A. All repairs of the cars come under me—wheels, trucks, cleaning inside and out, keeping them in perfect order. And, also, making up all the Washington trains.

1639 4. Q. State whether it is within your duties as car-inspector of that line to have the wheels taken out when they are worn too much to run properly, and new ones put in their places.

A. It is.

5. Q. State what are the different kinds of brakes used on the cars of the Washington line, since you have had charge of it.

A. They have on the cars of the Philadelphia, Wilmington and Baltimore road what they call the Stevens brake; the rod running from one truck to the other, without a lever in the center of the car. The New Jersey and the Camden and Amboy have a brake with a lever in the center of the car.

6. Q. Is this brake with the lever in the center of the car sometimes called the "center-lever brake?"

A. I think it is.

7. Q. State whether, since you have been inspector of the Washington line, you have found any difference in the length of time the wheels wear under the cars of the Philadelphia, Wilmington and Baltimore road, with the Stevens brake, and the cars of the New Jersey and Camden and Amboy roads, with the center-lever brake.

A. I have not, with the exception of some poor wheels of the Camden and Amboy road; they did not wear so long as the wheels of the Philadelphia, Wilmington and Baltimore cars. They broke out in the tread.

8. Q. Did you find any difference in the length of wear between the wheels of the cars of the roads inquired about in the case of the good wheels? Not these poor ones.

A. I did not.

9. Q. About how long, on an average, do you find that the wheels of the cars in the Washington line having the center-lever brake, wear?

A. Well, I have had some that wore as long as two years, and some that only wore three months. I should think about a year was the average of them.

1640 10. Q. What wheels was it that you found wore only three months?

A. Wheels that had some defect in them, loose wheels, wheels that broke out in the tread, and cracked wheels.

11. Q. What I want to know is what is the average length of wear of the wheels in the cars with the center-lever brake, when the wheels are not defective, and taking the cars on the whole?

A. I should think about a year.

12. Q. Do you keep any accounts of the wheels that you have taken out and put into these cars of the Washington line?

A. I do.

13. Q. Please state what kind of accounts you keep of them.

A. Accounts of every car and every wheel they are taken out from. I take the number of every car they are taken out from. I have a regular book, and take the day of the month the wheels are taken out, and the number of the car they are taken from.

14. Q. Please state whether you find any advantage in the use of the center-lever brake over the Stevens brake in reference to taking up the slack of the windlass chains, and in reference to the overlapping of the windlass chains on the windlass staff.

A. In the Stevens brake we are more troubled with it on the short curves in Baltimore; it stalls the horses so that we have to disconnect the rods to get them through the city sometimes.

15. Q. Is there any trouble of this kind with the center-lever brake?

A. No, sir; we hear no complaints of it.

16. Q. What is it which causes this trouble with the Stevens brake?

A. You have got to have your rods up so short that they won't let the truck twist enough to turn the curves.

17. Q. Why is it that you have to have your rods up so short?

1641 A. You have no power on them to apply the brakes to the wheels if you don't keep them up short.

18. Q. Suppose you let the rods out, what would be the result? I mean let the rods out so that the car-trucks would go very easily round the curves.

A. Your brake chains would wind up on your brake-shaft so that you couldn't get any power on your brakes. If you get them too slack your brake-levers will also draw right over against the cross-timbers of the truck-frame.

19. Q. In applying the brake to stop the car, which brake requires the most slack to be taken up, the center-lever brake or the Stevens brake?

A. The Stevens brake.

20. Q. State whether or not this having less slack to take up is an advantage in the center-lever brake; and, if so, why.

A. It is an advantage, because it is less work to keep it in repair.

21. Q. In which brake will the brake-shoes be made to bear quickest upon the wheels, from the time the brakeman commences to turn the windlass?

A. There is a good deal of difference in that whether the Stevens brake is in perfect order or not. The center-lever brake applies the quickest.

22. Q. What is the quicker application in the center-lever brake due to?

A. Well, I think on account of having the centre lever. In the Stevens brake you have got to catch your connection, and pull clear through to the other end of the car before you can get your brakes up.

23. Q. About how much more slack does this make necessary to be

taken up in the Stevens brake than in the center-lever brake, before the brake-shoes are brought up against the wheels?

A. There is from four to six inches more in the Stevens brake.

1642 24. Q. State whether or not it is this less slack which has to be taken up in the center-lever brake which causes that brake to apply the brake-shoes quicker than the Stevens brake.

A. I think it is.

25. Q. Please state which of the two brakes, the Stevens or the center-lever, is kept in order with the least expense, according to your experience with the Washington line.

A. The center-lever. I don't have half the complaints from them that I do from the Stevens brake. There are complaints every day from them.

26. Q. Why is it that the Stevens brake costs more for repairs than the center-lever brake?

A. The whole thing is on account of curves in the road in the streets of Baltimore; they tear the rods off when they are too tight. On the straight track they will run well enough, but when they get on those sharp curves, going around the corners of the streets, they stall the horses so that they can't get around the curves, and then the men get mad and tear the rods off, and the cars come through all the rest of the way without any brakes. As soon as the rods are disconnected the brakes are good for nothing. This happens often, and gives a great deal of trouble.

JOHN P. VAN DOREN.

(Cross-examination waived.)

George W. Brown, being duly called and sworn on the part of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

1643 A. George W. Brown; age, forty-two; residence, Harrison, New Jersey; occupation, that of car-builder.

2. Q. In what shop are you employed; how long have you been employed there, and what position in that shop do you hold?

A. In the shop of the New Jersey Railroad and Transportation Company, in Jersey City; have been employed there twenty-one years, and I am assistant foreman in said shop.

3. Q. About how many years have you been assistant foreman there?

A. About thirteen years altogether.

4. Q. What kind of work do you have in your charge, as assistant foreman in that shop?

A. All the repairs pertaining to cars—the passenger and freight cars.

5. Q. Do you also build new cars in that shop—both freight and passenger?

A. Yes, sir; I do.

6. Q. What kind of brakes are used on the passenger cars of the New Jersey Railroad?

A. The center lever brake.

7. Q. Is this brake sometimes called the Tanner brake?

A. It is.

8. Q. How many cars, altogether, are there upon the New Jersey road at the present time, running in the passenger trains?

A. We have got about one hundred cars, belonging to the New Jersey road.

9. Q. How many of these cars have the Tanner brake?

A. Pretty much all of them.

10. Q. State whether the majority of the passenger trains run by the New Jersey Railroad Company are what would be called heavy trains?

A. Yes, sir.

1644 11. Q. What kind of brakes are used upon the passenger cars belonging to the Camden and Amboy road?

A. The center lever brake—those that run over our road.

12. Q. When did you first go into the employ of the New Jersey Railroad Company?

A. July 10th, 1850.

13. Q. At that time, what kind of brakes were in use upon the passenger cars of that road?

A. There were single brakes, working on one track.

14. Q. At that time did you have anything to do with the repairs of these passenger cars with the single brake; if so, where, and for about how long?

A. I did; at the car shop in Jersey City, and up to the time we put on the double-acting brakes.

15. Q. At that time how many cars were there running in passenger trains, belonging to the New Jersey road?

A. About thirty.

16. Q. While these passenger cars were used with the single brakes, how often, on an average, did you have to take out the wheels because they were worn too much to run properly? Answer, taking the average of all the passenger cars then belonging to the road.

A. From four to six months, as near as I can get at it. Our wheels were not so good then as they are now.

17. Q. Since you have been using, on the New Jersey road, the Tanner brake, how long do you find that the wheels of the cars running in the passenger trains, to which the brakes are applied, will wear, on an average, without requiring to be taken out?

A. They wear a year.

18. Q. Was the speed of the passenger trains of the New Jersey road, at the time when they used the single brakes on those trains, the same or less than it is now?

A. It was less, to the best of my knowledge.

1645 19. Q. Do you know about what the speed of those passenger trains was then?

A. From twenty to twenty-five miles per hour on the Philadelphia trains.

20. Q. About what is the speed of the passenger trains on the New Jersey road—the Philadelphia trains—now?

A. About thirty miles per hour.

21. Q. Were the passenger trains on the New Jersey road at the time they used single brakes as heavy as they are now?

A. No, sir; they were not. The cars did not begin to be as heavy.

22. Q. State what effect, if any, this greater speed and greater weight of trains has upon the wearing of the wheels by the application of the brakes?

A. The additional heft and additional speed in coming to a stop—applying the brakes—wears the wheels.

23. Q. Does it wear them less or more than when the weight and speed are not so great?

A. The greater speed and weight wears them the most.

24. Q. Suppose the passenger trains, as they are with their present weight and speed, on the New Jersey road, had single brakes; state whether or not the wheels would wear out quicker, in your judgment,

than they did at the time when the single brakes were used on the passenger trains and the speed and weight of the trains were less?

A. I think they would wear out quicker.

25. Q. Are you familiar with the Stevens brake?

A. I have worked some with it.

Q. 26. Are you sufficiently familiar with it to say whether or not there is any advantage in the Tanner brake over it, in respect to the quickness with which the brake-shoes can be applied to the wheels?

A. I have tried it, and find I can put on the Tanner brake quicker than I can the Stevens brake, on account of the surplus chain in the Stevens brake. 1646

27. Q. State whether or not this is an advantage in the Tanner brake?

A. I think it is.

28. Q. Please state whether or not there is any advantage in the Tanner brake over the Stevens, in respect to the winding of the windlass chain around the windlass shaft; and, if so, please state what it is.

A. There is; in winding that surplus chain in the Stevens brake around the windlass shaft, we can't get the purchase on the wheels.

29. Q. What is the usual diameter of the windlass shaft?

A. On the New Jersey cars, about an inch and a half at the part where the chain winds round.

30. Q. In the Stevens brake, when the surplus chain is wound up around the windlass shaft, about what have you found to be the diameter or thickness at the part where the chain is wound, counting both shaft and chain?

A. Well, I suppose it would be in the neighborhood of five inches.

31. Q. About what is the diameter or thickness, in the Tanner brake, when all of the chain which is necessary to wind is wound around the shaft, counting both shaft and chain?

A. Not three inches. When the brake is in order, and it is wound up solid, we don't calculate to have more than three, or four, or five links of the chain around the shaft.

Cross-examined by M'r Whipple:

1. Cross-q. Do you know anything about the Stevens brake beyond what you have seen of its operation on the cars of the Philadelphia, Wilmington and Baltimore Railroad, which cars run in the through Washington line?

A. I do not, outside of the Washington line.

1647 2. Cross-q. In what way do you come to the conclusion that the wheels when used under the single brake, prior to your putting on the double brake, wore out after four to six months' use?

A. For the reason they had so much more purchase by braking on one truck, and sliding the wheels in stopping the trains.

3. Cross-q. Do you know that the wheels wore out in from four to six months, or is it only your opinion that such was the case?

A. To the best of my knowledge they were taken out as often as that.

4. Cross-q. Did you keep an account at that time as to the time when the wheels were put into a car, and when they were taken out to be replaced by others?

A. I did not, particularly, only by the oftenness we worked on the cars.

5. Cross-q. What do you mean by the oftenness you worked on the cars?

A. I mean putting new wheels in the same cars.

6. Cross-q. May not many of the wheels, then, at that time, have lasted more than four or six months?

A. There might, some more and some less.

7. Cross-q. Were the wheels at that time, in your judgment, as good as those now in use?

A. Some were and some were not, to the best of my knowledge. Some were very good wheels, and some were very poor ones.

8. Cross-q. Was the failure of the wheels, at that time, owing to the use of the single brake alone, or did other causes produce this failure? Please explain.

A. I think it was the use of the single brake in the sliding of wheels.

9. Cross-q. Did you have occasion to take out wheels injured from any other cause than the use of the single brakes?

1648 A. We did sometimes—loose wheels, sometimes cracked wheels.

10. Cross-q. How long would wheels last, on an average, to which no brakes were applied?

A. From a year to two years; may be longer, may be shorter.

11. Cross-q. How do you arrive at such a conclusion?

A. By wheels we have taken out; middle wheels in our six-wheel trucks.

12. Cross-q. Do you find that middle wheels wear longer than outside wheels?

A. We do.

13. Cross-q. Have you noticed any difference in the wear of the wheels on the inside of the truck, as compared with the outside wheels of the same truck?

A. No, sir.

Redirect:

1. Re. q. Please state about how many inches on the truck-lever, from the centre of the point of connection of that lever to the brake-beam, the connection is placed from that truck lever to the opposite brake-beam of the same truck, on the New Jersey road?

A. Six inches and a half.

2. Re. q. What is the distance from said connection with the other brake-beam, to the top of the truck lever?

A. About twenty eight inches.

3. Re. q. State whether this relative proportion of the two arms of the truck lever tends considerably towards equalizing the pressure upon the two brake-beams?

A. It does.

4. Re. q. When you testified in your direct examination about the wear of the wheels with the single brake, did you refer to the loose wheels and the cracked wheels, or to the average wheels which were in good condition, not loose or cracked?

1649 A. I referred to all the wheels which were taken out, to the best of my knowledge.

5. Re. q. What I mean is, did you, in speaking of the wheels which were worn out by the single brake, refer to any wheels other than those which were kept in the cars till they were worn out?

A. In speaking of that, I mean all the wheels we took out.

6. Re. q. Will you please now refer only to wheels which were in good condition, not cracked or loose, and state how often they had to be renewed on the average when the single brake was used?

A. I can only say what I said before, from four to six months, to the best of my knowledge.

7. Re. q. In what year, or about what year, was the use of single brakes given up on the New Jersey road?

A. Along in 1856 or 1857, before we got them all off, as near as I can remember. It was in 1851 that they put the first double brakes on.

GEORGE W. BROWN.

Adjourned to Sept. 12th, at 10.30 a. m.

1650 NEW YORK, *Tuesday*, *Sept.* 12, 1871.

JOHN B. HILL, being duly called and sworn on the part of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. John B. Hill; age, thirty-six; residence, Washington, D. C.; occupation, car-builder.

2. Q. How long have you been a car-builder?

A. I have been a car-builder six years. Before that, I served my apprenticeship as a coach and omnibus builder. I have also been engaged in building street-cars.

3. Q. By what corporation are you at present employed?

A. The New York and Washington air-line.

4. Q. Is that the corporation or consolidation of companies that manages the through lines between New York and Washington?

A. Yes, sir.

5. Q. What are the duties which you perform for the New York and Washington air-line?

A. Inspecting and superintending repairs and cleaning of the cars in the through lines between Washington and New York.

6. Q. State what duties these "repairs" include?

A. Putting in wheels, and casual repairs.

7. Q. About how long have you been engaged in these duties, and where are you stationed to perform them?

A. Two years; at Washington Station.

8. Q. Is there anybody else who has anything to do with these duties as to these through lines at Washington?

A. No, sir.

1651 9. Q. Who is the party who performs the same duties as to these through lines at Jersey City, the other end of the route?

A. John P. Van Doren.

10. Q. Is there anybody but M'r Van Doren who has anything to do with these repairs at Jersey City?

A. Nobody else.

11. Q. Are you familiar with the different kinds of car-brakes used on the cars of these through lines?

A. Yes, sir.

12. Q. What kind of brake is used on the cars in these lines belonging to the New Jersey and Camden & Amboy railroads?

A. The center lever, double-acting brake.

13. Q. What kind of brake is used on these cars in these lines belonging to the Philadelphia, Wilmington and Baltimore road, and the Baltimore and Ohio road?

A. What is called the Stevens brake.

14. Q. State whether you make written statements of the number of car-wheels which you take out and replace by new wheels in the cars of said lines, and of the cars from which you take them out; if so, how often do you make up such statements?

A. I do; on or about the first of each month.

15. Q. State how long you have been keeping written accounts of the number of wheels taken out of these cars?

A. At least a year and a half.

16. Q. Please state whether these duties of yours require you to observe the wear of the car-wheels in these through cars, from the application of the brakes to them?

A. Yes, we examine the wheels thoroughly every day. I do it myself with others to assist me.

17. Q. State whether you find any difference in the length of time which the said car-wheels wear—so far as regards the effect produced
upon them by the application of the brakes—between the wheels
1652 of the cars which have the center lever-brake, and those which
have the Stevens brake?

A. There is no difference.

18. Q. State about how long the car-wheels in those lines last, on the average, before requiring to be replaced by new ones?

A. About twelve months.

19. Q. Do you apply this last answer to all the cars alike—those with the centre-lever brake and those with the Stevens brake?

A. Yes.

20. Q. In any of these through-line cars which have the Stevens brake, is there any difficulty experienced in getting such cars around the curves in the streets of Baltimore? If so, what is such difficulty?

A. There is with the cars of the Philadelphia, Wilmington, and Baltimore road, caused by the rods connecting the draw levers with the brake shafts some times catching either on the king or other bolts—which causes the brakes to be put on at said curves; this sometimes causes the cars to stick on the curves; sometimes, also, when the brakes are left slack enough for the cars to get around these curves in Baltimore, they will not hold on the heavy grades on the straight tracks. We sometimes have to disconnect the brake-rods in order to get cars around these curves. We frequently do this.

21. Q. State whether any such difficulties as these are experienced with the cars in said through-lines which have the centre-lever brake?

A. There are not.

22. Q. Are there any advantages in the centre-lever brake over the Stevens brake as used on the said Philadelphia, Wilmington, and Baltimore cars, in reference to the matter of repairs? If so, what?

A. There is less repairing to be done to the centre-lever brake than to the Stevens brake.

1653 23. Q. State whether you are familiar with the construction and operation of the single brake, operating on only one truck.

A. I am.

24. Q. In your opinion, as a railroad man, if the cars of the New York and Washington through-lines had upon them single-acting brakes, would there be any more, and, if so, how many more sets of wheels required for each car in a year than there are now required in the same time on those of said cars which have the centre-lever brake?

A. It would require more sets of wheels—at least two more sets in a year than with the centre-lever brake. I mean that with the single brake three sets of wheels in all would be required to go through the year, against one set with the centre-lever brake in the year.

J. B. HILL.

Adjourned to Sept. 13th, at 10.30 a. m.

1654 WEDNESDAY, *Sept.* 13, 1871.

HUMPHREY JACKMAN, a witness duly called and sworn on behalf of complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Humphrey Jackman. Age, fifty-seven. Residence, South Bergen, New Jersey. Mechanic by occupation.

2. Q. Are you employed by any railroad company? If so, by what company?

A. I am; by the Central Railroad of New Jersey.

3. Q. In what capacity are you employed by them?

A. I am now employed at the Communipaw shops, putting up pistons, the main connections, and parallel rods, of locomotive-engines. I have several men under me.

4. Q. How long have you been in the employ of said Central Railroad of New Jersey?

A. Eleven years this fall.

5. Q. Previously to being employed by said Central Railroad were you employed by any railroad in New Hampshire? If so, by what company?

A. I was; by the Concord & Nashua R. R. Co.

6. Q. From what time to what time were you employed by the Concord & Nashua R. R. Co.?

A. I went there between 1847 and 1850, and with the exception of about six months that I was on the Vermont Valley road putting up locomotive-engines. I remained there till 1859.

7. Q. At the time you first went on to the Concord & Nashua road, what kind of brakes were in use on the passenger-cars of that road?

A. The single brake.

8. Q. At any time while you remained on said road, was there any change made in the brakes on the cars running in the passenger trains?

A. There was.

1655 9. Q. What kind of brake was put on said cars when this change was made?

A. A brake similar to the one I saw in this office yesterday—a double-connected brake.

10. Q. Do you remember any name by which said brake was called?

A. I don't positively remember the name, but I think it was called the Tanner brake.

11. Q. Do you recollect whether it had a cross-lever under the centre of the body of the car?

A. It did have.

12. Q. About how long before you left said road, in 1859, was said cross-lever brake put on?

A. I don't remember exactly, but several years before I left.

13. Q. While you were on said Concord & Nashua road, did you have opportunities to observe the effect of the car-brakes upon the car-wheels, both when the single brakes were used and when the cross-lever brakes were used; if yea, please state what your opportunities were.

A. I did. My opportunities were that, in case of any accident or overwork on the road, we were called out of the shop to assist in running the road, taking various positions on the road; and also by being intimately connected with the builder of the trucks of the cars, the man that had charge of running them, and the road-master.

14. Q. In what shop did you yourself work?

A. I had charge of putting up the engines.

15. Q. How near was the shop where you did your work to the shop where the work on, and the repairs of, said cars were done?

A. Right in one shop; the shops were all connected.

16. Q. Did you have occasion, and, if so, about how often, to see the cars when they were brought into the shop for repair, while they were being repaired, and when the wheels and brake rigging were in them?

1656 A. I had daily observation. I didn't take notice every day, but whenever they were in there I used to see them as a matter of discussion in regard to the value or merits of the two brakes.

17. Q. Which brakes do you mean by the two brakes?

A. The single and double brakes.

18. Q. After the said cross-lever brakes were put on said cars, was there any improvement with regard to the effect upon the car-wheels over the single brake?

A. There was.

19. Q. After the cross-lever brakes were put on, what was this improvement?

A. It was claimed that they saved about two-thirds—that one set with the cross-lever brake would wear as long as three sets with the single brake.

20. Q. Who claimed this?

A. It was claimed by the heads of the departments of the road; M'r Gray, the road-master; M'r Jacob Wheeler, the truck-builder and fitter of the wheels; and Charles K. West, the general superintendent of the cars and of the keeping them up.

21. Q. Did you yourself hear these parties make these claims or statements?

A. I did.

Cross-examined by M'r Whipple:

1. Cross-q. You say it was claimed that they (the cross-lever brakes) saved about two-thirds—that one set with the cross-lever brake would wear as long as three sets with the single brake. Do you know anything about this matter of the single and double brakes compared, in the matter of saving wheels, from your own knowledge?

A. I do.

2. Cross-q. Please state in what that knowledge consists.

A. From actual observation.

1657 3. Cross-q. Please state in detail what you have observed in relation to this matter of saving wheels by the use of the single and double brakes compared.

A. My own observation in seeing it didn't give so extensive knowledge as what I obtained from these heads of departments I spoke of. The single brake caused more flat places to make the wheels useless that the double-connected cross-lever brake. What I did observe was that the single brake caused flat places in the wheels that rendered it necessary to throw them away—rendered them useless. My observation was seeing the wheels rolled in, and taken off, and replaced with new ones—just as if it was right in one corner of this room and my work was in another corner of the same room, so that it was just under my eyes.

4. Cross-q. Did you ever observe any wheels being taken off having flat places in them after the application of the double brakes?

A. I did.

5. Cross-q. To what extent did the application of the double brake diminish the sliding of wheels, compared with the single brake?

A. It was claimed about three to one. It will be impossible for me to give an exact account of the difference, because the road was increasing its stock and other roads were connecting with it, so that I judge from my observation, and what the heads of departments I have spoken of said about it.

6. Cross-q. Who is Jacob Wheeler, and where does he now live?

A. He has left the shop, and, if living, is on a farm about eight miles from Concord.

7. Cross-q. Where is M'r Gray?

A. He was appointed keeper of a light-house about the beginning of the war.

8. Cross-q. Where is Charles K. West?

A. He is dead.

1658 9. Cross-q. What other names connected with that road know about the matters you have testified in relation to—the wearing of wheels with the different brakes?

A. John Kimball and Harvey Rice, both parties residing in Concord.

10. Cross-q. What kind of shoes were the brakes shod with at that time?

A. Principally leather, sometimes wood.

11. Cross-q. How are brakes now shod?

A. With iron.

12. Cross-q. What in your opinion would be the comparative wear of single brakes shod with iron, compared with double brakes shod in the same way, at the present time, upon the wheels of cars?

A. I think there would be no difference.

13. Cross-q. Would the double brake slide the wheels just as quick as the single brake with the same power applied to the windlass wheel?

A. It will not as a general thing. The power is more equally adjusted so that it will not bring it all upon one truck; it is more equally divided between all the wheels.

14. Cross-q. Is there any way to diminish the power on the single brake? If so, please state what way.

A. By not winding it up so hard the power would be less.

15. Cross-q. Is it not a rule on all railroads that brakesmen shall not wind up any brake so hard as to slide the wheels?

A. It is the rule.

16. Cross-q. Was it the rule on the Concord road when they used the single brake?

A. They did make a rule—I think a special order—on that road, while the single brake was in use.

17. Cross-q. What was the penalty if a brakeman was found to continue to disobey such order?

1659 A. I never heard of any one. I presume the penalty would be discharge. I never heard of any one being discharged for it.

18. Cross-q. Is the sliding the wheels caused by applying the brakes too hard?

A. As a general rule it is. There could be exceptional cases.

19. Cross-q. With such a rule in force do you think the wheels under the single brake would be worn out as three to one, compared with the double brake, under the same rule?

A. I should think they would, on account of the imperfection of applying the power to the single brake.

20. Cross-q. Is there any difference in the application of power to the brakes of a truck, whether it is applied to one truck by the single brake,

or to both trucks by the cross-lever brake, other than that in the latter case it is applied to both trucks simultaneously?

A. It is claimed that there is.

21. Cross-q. What is the difference?

A. From my own observation in running I would not be able to state just what the difference is; but it is claimed that in the single truck in the application of the shoes upon the wheels it strikes one pair of wheels a little before it does the other, and to produce friction enough to hold the carriages, it slides one pair of wheels while it is creating friction enough on the other pair to hold the car. With the cross-lever brake—that it holds all the wheels more equal so that the friction will hold all the wheels at once, so as to make the friction on the track equal, without sliding the wheels.

22. Cross-q. That is true, is it, with regard to the cross-lever brake?

A. It is, as far as my observation goes and means of knowledge.

23. Cross-q. What kind of brakes are used on freight-cars generally?

1660 A. I could not say. The most of the freight-cars on the Concord road were altered over from single to double brakes, the same as the passenger-cars.

24. Cross-q. What kind of brakes are used on the Central Railroad of New Jersey on the freight-cars?

A. I do not know, sir. I don't know as I ever looked at them.

25. Cross-q. What kind of brakes are used on the passenger-cars of that road?

A. They are double brakes of two patterns, I believe. My chance for observation on that road is very limited; I merely see them occasionally.

26. Cross q. What two patterns?

A. One is the cross-lever brake, and the other has two cross-levers.

27. Cross-q. So far as your observations go, is the single brake in use on freight-cars, or the double brake?

A. I see only a few freight-cars that do the local business; they have the double brake.

28. Cross-q. On what road do you speak of the "local business"?

A. The Central Railroad of New Jersey; most of the heavy business goes to Elizabethport.

29. Cross-q. Am I to understand that the freight-cars that do the local business that pass your shop, have the double brake on?

A. I couldn't say that they all have it on.

30. Cross-q. Can you say that any freight-car has it on?

A. Yes, sir.

Redirect:

1. Redirect q. What "wear" did you refer to in your twelfth (12th) cross-answer; the wear of the shoeing or covering of the brake-head, or the wear of the car-wheels?

1661 A. My answer, as I took the question, was that there was no difference in the holding power of the brakes on the wheels.

2. Redirect q. You said that when the single brakes were used on the Concord road, the brake-heads were shod principally with leather, and sometimes with wood. Was there any change made in this respect when the cross-lever brake was adopted?

A. None that I know of.

3. Redirect q. About what was the average speed of the passenger-trains on the Concord road at the time the single brakes were used there?

A. I should think from twenty to twenty-five miles per hour, including stops.

4. Redirect q. And what was the average running time?

A. I could not state exactly; I should think they would average about forty miles per hour; I am referring now to the express-trains.

HUMPHREY JACKMAN.

Humphrey Jackman recalled for complainant:

1. Q. Will you please state more fully the circumstances under which the express-trains you referred to in your deposition a little while ago, ran forty miles an hour?

A. That was not including stops; at the time, two routes from Boston, of one of which the Concord and Nashua was a part, were contesting for the British mail and the business through that way, and this led them to run at this high speed. After M'r Gilmore came in as superintendent he reduced the speed to about thirty miles per hour.

1661 2. Q. After the cross-lever brake was introduced on the Concord road, how long, if you know, did the car-wheels, on an average, last without requiring to be replaced on account of flat spots?

A. I could not give an answer to that; I only know the difference from my own observation, and that there was a great difference.

(Witness here says he desires to state, in reference to what he has testified above, in relation to double brakes on the local freight-cars, that he is unable to say that the freight-cars on which he saw the double brakes belonged to the Central Railroad of New Jersey.)

HUMPHREY JACKMAN.

Patrick S. Devlan, a witness duly called and sworn on behalf of complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Patrick S. Devlan; age fifty-one; residence Jersey City; my trade is that of machinist.

2. Q. Were you ever in the employ of any railroad company; if so, of what company or companies?

A. I was first employed by the Tamaqua Railroad Company; next by the Reading Railroad Company; next the Harrisburgh and Lancaster; next the Cumberland Valley; next the Central Railroad of New Jersey, which was the last.

3. Q. In what capacity or department were you employed on these roads?

A. On the Tamaqua as engineer; on the Reading in the department of construction; on the Harrisburgh and Lancaster as engineer; on the Cumberland Valley as engineer; on the Central Railroad of New Jersey in the repairs of engines.

1663 4. Q. About how many years in all were you practically employed on railroads?

A. Since 1835.

5. Q. About when did you leave the employ of the Central Railroad of New Jersey, which you say was the last road you were on?

A. In 1862.

6. Q. While you were engaged on any of these railroads, did you become familiar with the construction and operation of what is called the single brake, acting on only one truck of the car?

A. Yes, sir.

7. Q. Was there at any time, upon any of these roads, a change made

in the brakes which were applied to the cars running in the passenger trains; if so, what was the change?

A. There was—from the single to the double-acting brake.

8. Q. What was the form or name of the double-acting brake to which the single brake was changed?

A. I don't know that I can state the name. We always called it the double-acting brake.

9. Q. State whether it had a cross lever under the centre of the body of the car.

A. It had.

10. Q. State whether, while you saw the single brake in use upon the cars you have mentioned, you had opportunities of seeing what were the effects of it upon the wear of the wheels of the car.

A. I had opportunities. I have frequently rode on the cars and seen the single brake block the wheels instantly, when it was applied. It required a man to be skilled very thoroughly as a brakeman to apply the brakes properly with the single brake. I have seen a pair of wheels spoiled going down one grade with the single brake on the Reading Railroad.

1664 11. Q. State whether you had opportunities of seeing the trucks and car-wheels when sent into the shops for repairs, when the single brake was in use on the roads you have mentioned.

A. I had.

12. Q. State whether you had opportunities of seeing the effect on the car-wheels after the cross-lever double-acting brake was introduced on any of the roads you have mentioned.

A. I had. The turning of the axles, the boring of the wheels, and the putting the wheels on, came directly under my charge, and I had every chance to see them.

13. Q. Was there any difference in the effect produced on the car-wheels after the cross-lever brake was introduced, as compared with the single brake; if so, what was the difference?

A. There was a difference. We always considered there was a saving of from three to four sets of wheels a year with the cross-lever brake over the single brake.

14. Q. Taking the average of passenger trains on any railroads with which you were familiar, say in the year 1862, and suppose that instead of double-acting brakes on such trains single-acting brakes had been used; what, in your judgment, as a practical railroad man, would have been the results as to the power of the brakemen over the trains, and as to the wearing of the wheels?

A. They would have to have at least double the number of men; there would be more liability to accident; they couldn't hold the train with one-tenth part of the power that they could with the double-acting brake; there would be an extra wear on the brass journal bearings. I have put in two sets of brasses in a month with the single brake against one set in three months with the double-acting brake; and there would be a wear of at least three times as many wheels with the single brake as with the double brake.

1665 15. Q. Do you know what these brass journal bearings cost per set; if so, how much?

A. They will average eight pounds each. The least I have ever known them to sell for is thirty-five cents to thirty-eight cents per pound. There are eight of these brasses to a car.

16. Q. When the brasses have to be replaced, what are they worth as old brass?

A. Half price.

17. Q. Is there any difference in the effect produced upon the railroad track by the use of wheels acted upon by the single brake, and wheels acted upon by the cross-lever double brake?

Q. There always is a lamination of the track or rail where there is a sliding of the wheels. I should think there was a difference in favor of the double brake, on account of the wheels not sliding.

18. Q. Are you able to state whether this difference is considerable or not?

A. I don't think I can say as to the exact extent. I think the difference is considerable.

19. Q. About how long, on the average, did the car-wheels last before requiring to be replaced, on the roads you have mentioned, after the cross-lever double-acting brake was introduced?

A. The average was between two and three years.

(Cross-examination waived.)

PATRICK S. DEVLAN.

Adjourned to Thursday, Sept. 14th, at 10.30 a. m.

1666 THURSDAY, *Sept.* 14, 1871.

PATRICK S. DEVLAN, recalled on part of complainant:

20. Q. In answering the question put to you yesterday in respect to the average wear of the car-wheels after the cross-lever brake was introduced, what wheels were you referring to, as an average?

A. I meant the best wheels on the Reading road.

21. Q. Will you now state what, according to your observation, was the average wear of car-wheels in passenger trains, when the double-acting brake was used, taking the average of all the wheels in the market?

A. About twelve months.

22. Q. Will you please read over your answer to the 13th question put to you yesterday, and state how you meant to be understood in that answer?

A. I meant to convey that there would be a saving of from two to three sets in the course of a year; that is, I mean, taking the set that was in the car, it would take three to four sets to go through the year with the single brake, against one set in the year with the cross-lever brake.

Cross-examined by M'r Whipple:

1. Cross-q. Are you familiar with the construction and operation of the cross-lever double-acting brake?

A. I am.

2. Cross-q. Please explain its construction, and wherein it differs from the single brake, as applied to the trucks of a car.

A. I don't know that I can explain it any better than by saying that the brake-blocks are all connected so as to be operated by one man, acting upon all the eight wheels instead of four.

1667 3. Cross-q. Wherein does the mechanism of the brake, so far as the trucks are concerned, when the single brake is used, differ, compared with the same mechanism when the brakes are connected?

A. The single action is a direct action, and we call the double acting a compound connection. I don't know that there is any difference in the construction of the brake in the trucks, except in the hanging of the brakes.

4. Cross-q. Wherein do they differ in the hanging?

A. There is a vast difference in the single acting brake in the mode of applying it.

5. Cross-q. Please state that vast difference—in what it consists?

A. One way of hanging it was a cross between the two wheels, to act on the brake blocks.

6. Cross-q. What do you mean by "cross"?

A. I think I can hardly show but by a diagram.

7. Cross-q. What is the ordinary, common, method of applying brakes to a single truck? Please explain the parts that make up a single brake, as you say you are familiar with the construction of brakes.

A. The ordinary, common, method now is a frame hung in front of and behind the wheels, acted on directly by the lever—the two connected together; that is what makes up a single brake, acted on directly by the lever. There are different modes of applying the lever.

8. Cross-q. What more is the cross-lever brake than the union of two single brakes?

A. Well, there is a combination of leverage there that you don't get in the two single brakes; couldn't get it.

9. Cross-q. Is or is not the mechanism of the trucks, so far as the brakes is concerned, the same, whether used as a single or double brake?

A. That would be a hard question to answer direct, there have been so many improvements made in the construction of trucks. There is as much difference in the construction of trucks as there is in locomotives.

1668 10. Cross-q. Then you don't know whether there is any difference or not in the mechanism of the trucks, so far as the brakes are concerned?

A. Not at the present time.

11. Cross-q. What regulation, if any, was had on the Reading road, in regard to brakemen sliding wheels?

A. As a general rule, they were discharged if they were known to do it.

12. Cross-q. Did this regulation apply to brakemen employed on both freight and passenger trains?

A. As a general thing it did.

13. Cross-q. Did this regulation have the effect to prevent the brakemen from sliding the wheels?

A. I don't know that it did.

14. Cross-q. Did the brakemen slide the wheels after the double brake was applied?

A. I don't know of any instance, except with the Leahey brake, which was so severe that it would lock the whole eight wheels.

15. Cross-q. Was this Leahey brake operated by brakemen?

A. No, sir; by the engine bumper.

16. Cross-q. If too much power be applied to a brake, is there any way, within your knowledge, to diminish that power so as to prevent brakemen sliding the wheels?

A. It rests with brakemen entirely. Hence a green hand never makes a good brakeman.

17. Cross-q. If the wheel attached to the standard by which the brakeman applies the power to the brakes is made smaller than the usual size, what effect will such diminution of size have?

A. If a practical brakeman, he will exert more power in turning the wheel. A practical brakeman can tell to a fraction what power is required to prevent sliding the wheels, as a general thing.

18. Cross-q. Did they have practical brakemen on the Reading road when you were there?

A. Part of them were.

1669 19. Cross-q. What kind of brakes were used on the freight cars of the Reading road when you were there?

A. The single and double acting brakes.

20. Cross-q. On such cars as the single brake was used, was the destruction of wheels by sliding as three to one, compared with the wheels on the cars on which the double brake was used?

A. It was generally considered so by the car-builders. It may have been less on the freight cars; there was a vast difference.

21. Cross-q. What do you know of the matter of your own knowledge?

A. I furnished the wheels and axles; they came under my supervision.

22. Cross-q. Did you take account of the wheels after they were used under the cars, so that you are prepared to say how long they wore, both under the single and the double brake?

A. I furnished the wheels and axles, and had to take the word of the car-builder as to the difference in the wear. It was the general talk that that was the average difference in the wear, by the car-builders. I did not keep an account of the wheels after they were used. I kept an account of the wheels that went out.

23. Cross-q. What car-builder on the Reading road did your hear say there was this difference of three to one in the wear of wheels, when used under the single brakes, compared to the same use under the double brakes?

A. Samuel Spotts.

24. Cross-q. What other person or persons did you hear make these statements?

A. The master machinist of the road, Louis Kirk.

25. Cross-q. Where is he?

A. He is dead.

26. Cross-q. Any other persons?

A. It was the general remark about the place.

1670 27. Cross-q. In view of the fact that the cross-lever brake is but a connection of two single brakes, how do you account for your statement that the difference between the single brake and double brake in sliding wheels, and thereby spoiling them, is three to one?

(Question objected to, because the statement in it that the cross-lever brake is but a connection of two single brakes is incorrect.)

A. I don't know how I can account for it otherwise further than that a man can lock two or four wheels, and can't regulate his power so well on the wheel or lever as he can with the double-action brake. It is almost an instantaneous action with the single brake; the double brake is more gradual.

28. Cross-q. Could a brake wheel be put upon the standard upon which the chain winds of such diameter that the brakeman could not slide the wheels by the brakes of a single brake?

A. Certainly, you could put a wheel on two inches in diameter, and you could not turn it, or more than turn it.

29. Cross-q. Could you increase the power the brakeman would have over the wheels by increasing the diameter of the brake-wheel?

A. Certainly; the larger the more leverage he would have.

PATRICK S. DEVLAN.

Luke F. Tronson, being duly called and sworn on the part of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Luke F. Tronson; age, fifty-four years; residence, Newark, New Jersey; occupation, machinist.

1671 2. Q. Are you in the employ of any railroad company? If so, what company?

A. Yes, sir; the Morris and Essex division of the Delaware, Lackawanna and Western R. R.

3. Q. How long have you been employed by the Morris and Essex Company?

A. Thirty-one years and upwards.

4. Q. Are you familiar with what is called the single-acting brake for cars?

A. Yes, sir; somewhat acquainted with them.

5. Q. Was said single brake used upon said Morris and Essex R. R., on cars running in passenger trains, at any time since you have been employed there?

A. Yes, sir.

6. Q. State from about what time to what time such brakes were used upon such cars.

A. From the year 1840 to, I think, in the neighborhood of 1852—1852 or 1853.

7. Q. At this time—1852 or '53—was there any change made in the brake used on the cars running in the passenger trains on that road?

A. Yes, sir.

8. Q. What was that change?

A. They put what we called the centre-lever brake on—the cross-lever brake.

9. Q. How near was the shop where you worked on this road at this time to the shop where the work on and the repairing of the cars was done?

A. One shop adjoined the other.

10. Q. Do you know what was the general opinion of the men in charge of the cars running in the passenger trains on that road in regard to the effect of this change from the single brake to the cross-lever brake? If so, what was it?

A. They liked the double brake better than the single brake. This is what the men who used the brakes stated. The men who had 1672 charge of the cars preferred the cross-lever brake—for one thing, because of the greater durability of the wheels.

11. Q. State, if you know, what was the general opinion among these men who had charge of the cars as to how much longer the car-wheels lasted with the cross-lever brake than they did with the single brake.

A. The man who was foreman of the car department at that time—William Pierson—told me that he thought he could save two sets of wheels out of three. What he meant by that was that it would take three sets of wheels with the single brake where one set would last as long with the cross-lever brake.

(Answer objected to as hearsay.)

12. Q. What I want to get at is not what any particular man said, but what the general opinion on this matter was among the men who had charge of the cars.

A. I hadn't conversed with any but Mr Pierson on this particular subject.

Cross-examined by M'r Whipple:

1. Cross-q. Do you know anything as to the matter testified to in relation to the comparative merits of the single and double brakes, in the matter of sliding wheels, of your own personal knowledge?

A. Not of my own personal knowledge; but I can tell you just what they told me about it.

LUKE F. TRONSON.

Adjourned to Friday, Sept. 15, at 11 a. m.

1673 FRIDAY, *September* 15*th*, 1871.

SAMUEL L. MOORE, being duly called and sworn on the part of complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Samuel L. Moore; age, sixty-eight years; residence, Elizabethport, Union County, New Jersey; occupation, foundry machinist.

2. Q. Have you ever been employed upon any railroad? If so, upon what railroad?

A. I have—three or four—the Philadelphia and Trenton R. R., the New Jersey Railroad and Transportation Company, the Corning and Blossburg road, and the last road was the Central Railroad of New Jersey.

3. Q. Are you familiar with the construction of what is called the "single brake" for railroad cars?

A. Yes, sir. I have seen almost all kinds of brakes ever invented up to the last ten or twelve years.

4. Q. At any time while you were employed upon any of the roads you have mentioned was the single brake used upon such roads?

A. Yes, sir.

5. Q. Upon what kind of cars was it used on such roads?

A. First upon four-wheeled cars, and afterwards upon eight-wheeled cars.

6. Q. In what kind of trains did these eight-wheeled cars run?

A. In all kinds—passenger and freight.

7. Q. At any time while you were engaged in railroading was there any change made in the kind of brakes used on the cars running in passenger trains?

A. Yes; they threw away the single brake and put on the double brake—the Hodge, Stevens, and Tanner; they all came up about the same time; I can't tell which we put on first.

1674 8. Q. After the double brake—say the Tanner brake—was put on these cars, was there any improvement or saving produced from the use of it?

A. Yes; I think there was.

9 Q. What was this improvement or saving?

A. Why, in the first place, they were more sure—stopped the train quicker; in the next place, they were easier kept in repair; in the next, the wheels lasted from one-half to two-thirds longer.

10. Q. Taking the wheels under an eight-wheeled car as a set, how many sets, in your judgment, would be required with the single brake to last through the same time that one set with the Tanner brake would last through?

(Objected to.)

A. Well, it would take from two and a half to three sets.

Cross-examined by M'r Whipple:

1. Cross-q. You say, in your answer to the seventh interrogatory, that they "threw away the single brake." Do you mean that they dispensed with the use of it altogether on all their cars, both freight and passenger, and substituted therefor the double brake?

A. No, I don't; but I mean to say that when the old brake wore out and had to be renewed, or we got new cars, we threw away the old brake and put on the new one. I saw a car yesterday that still had the old single brake on it.

2. Cross-q. How was the single brake constructed that you say was thrown away?

A. Well, I don't know; there was about as many ways of construction as there was cars. The general way on the passenger cars was to have a rock-shaft between the truck-wheels, and a toggle-joint from the rock-shaft to the brake-block, where the wheels were far apart. Some had only a toe on the rock-shaft.

1675 3. Cross-q. Was this kind of brake thrown entirely away when the Tanner brake was substituted?

A. It was; the single brake was entirely abandoned when they put on the double brake—on all good cars.

4. Cross-q. Please describe the mechanism of the Tanner brake, as applied to the trucks.

A. The Tanner brake has eight friction-blocks connected by rods to the windlass-staff at either end of the car, so that from either end the brakemen can apply them all to the wheels of the car. As to the mechanism in the trucks, there is one lever in each truck to operate the brakes in the truck. I think that is the Tanner patent.

5. Cross q. Was not one lever used in the truck, with proper connections for operating the brake-blocks, in use before the date of the Tanner patent?

A. Yes, I think there was.

6. Cross-q. Then how do you make it out that such connection is the Tanner patent?

(Objected to, as the *the* witness has not made any such statement.)

A. Tanner, I suppose, don't patent the lever, but the combination of levers; else his patent wouldn't be good for anything. The old-fashioned brake only broke on one truck.

7. Cross-q. What is the Tanner patent but a combination of the lever in each truck, as used in the single brake, with each other, by means of a cross-lever and the windlasses of the car? If it is not this, please state what it is.

A. The difference is that the cross lever connects the mechanism in both trucks to each other so that they can be operated from both ends of the car; and if one connection breaks from the brake-staff, both brakes can be operated from the other end of the car.

1676 8. Cross-q. Why is it, as you stated, that wheels will last longer when used under the double brake than when used under the single brake?

A. Because they don't slide them so much.

9. Cross-q. Are not the wheels slid when used under the double brake?

A. They are sometimes, but nothing like they are under the single.

10. Cross-q. By diminishing the diameter of the wheel on the windlass-staff, cannot you prevent sliding the wheels either in the single brake or the double brake?

A. Of course, if you are a mind to take the power off, you can't slide the wheels. Then you can't brake up. You might do as they did in the old times, run cars without any brakes; then you couldn't slide the wheels.

11. Cross-q. When, in your judgment, do brakes hold the best, when the wheels are sliding or when rolling, provided the power in either case has been applied efficiently?

A. They hold best when they are rolling.

12. Cross-q. Then may not the diameter of the windlass-wheel be so proportioned to the braking to be done, both as respects the single and double brakes, as to do effectual braking without sliding wheels in either case?

A. No. The reason is no man can pretend to say that you can retard a railroad car as much with four wheels as you can with eight wheels. I understand your question, but it cannot be done.

13. Cross q. Why cannot be done?

A. For the reason that the power it will take to slide a wheel one day will not do it another; you can't do it because you cannot regulate the power; it will take more power one day than it will another; it will take more power to slide the wheels under a heavy loaded car than it will under a light one.

1677 14. Cross-q. Assume that it requires a windlass-wheel thirteen inches in diameter to brake the two trucks of a car by means of the double brake, under the various circumstances that occur, may not a smaller wheel do the same work as effectually, without sliding, on one truck, as a larger wheel does on two trucks, and this without sliding the wheels in either case?

A. Well, you might put the same power with a small wheel by exerting more force on the windlass-wheel.

(The question being read again to the witness, he answers: No; you cannot.)

15. Cross-q. Why not?

A. Because a man can slide the whole eight wheels by putting power enough on; he can't do any more on four wheels than to slide them, only it won't take quite so much physical strength.

16. Cross-q. Can the size of the windlass-wheel be so small in both cases, that is when applied to a single brake or a double brake, as to prevent sliding wheels in either case?

A. Why, certainly it can be. You can take it off altogether and then you won't brake any.

17. Cross-q. Do you think there would be any sliding wheels by the use of the single brake with a windlass-wheel six or eight inches in diameter?

A. It would be altogether owing to the length of the fulcrum and the length of the levers. If you had your fulcrum short enough, you could slide your wheels then; if your fulcrum is short enough, it would take very little power on the windlass-wheel to slide the wheels of the car.

18. Cross-q. May not the size of the windlass-wheel and the proportions of the lever be such as to prevent sliding wheels in a single brake, ordinarily?

A. Certainly it can. You can make it so it can't slide the wheels, but the next thing is whether that would be sufficient to stop the car.

1678 19. Cross-q. Is the car best controlled or retarded when the wheels are sliding on the rail under the brakes?

A. No.

Redirect:

1. Redirect q. State whether, in the case supposed in the eighteenth cross-interrogatory, if the brakeman should apply strength enough he could slide the wheels.

A. Certainly he could.

2. Redirect q. State whether at the time the Tanner brake was introduced on the roads you have spoken of, the various matters you have been asked about—in respect to the effect of increasing or diminishing the size of the windlass-wheel, and altering the fulcrum and the length of the levers—were known to railroad men.

A. I suppose so. Men were not fools forty years ago any more than they are now. They knew something about the power of levers.

3. Redirect q. Did you yourself know about the various matters referred to at the time inquired about?

A. Of course I did. I was over thirty years old when I began railroading.

Recross:

20. Cross q. Was it allowable among railroad managers that brakemen should use their entire physical force upon the brake windlasses when applying the brakes?

A. No. It was generally their orders not to slide the wheels.

21. Cross-q. What penalty, if any, was attached to such misdemeanor?

1679 A. I don't know of any. If there had been they wouldn't have had many brakemen.

22. Cross-q. Was the kind of single brake in use before the double brake called the rock-shaft brake, applied by a foot-lever?

A. I don't know as it was called the rock-shaft brake, but it had a rock-shaft in it, and a lever that come up and you put your foot on it.

23. Cross-q. Am I to understand that this was the single brake in general use on roads before the double brake was introduced—that is, so far as your knowledge extends?

A. It was the brake that was in universal use say from 1840 to 1845, or 1846 or 1848, or to the time when the lever single brake was introduced.

24. Cross-q. To what extent was the lever-brake adopted thereafter?

A. Universally, generally, on the good roads—easier got up and easier kept in repair.

25. Cross-q. With which was the brakeman most liable to slide the wheels, the rock-shaft brake or the lever-brake?

A. The rock-shaft brake, if it was in good order.

26. Cross q. Is your comparison of the saving in wheels between the double brake and the lever-brake, or as between the rock-shaft brake and the double brake?

A. I don't know, but I think more likely between the rock-shaft brake and the double brake, because the rock-shaft brake went out of use some time before we got the double brake. I am satisfied the old rock-shaft brake used to grind up the wheels a great deal faster than any other brake.

SAM'L L. MOORE.

1680 **John P. Van Doren**, recalled on part of complainant, testified as follows:

1. Q. Have you ever been in the employ of the New Jersey Railroad

and Transportation Company? If so, in about what year did you first enter their employ?

A. Something like sixteen years or seventeen years ago.

2. Q. How long did you remain in their employ?

A. Ever since; am partly under their control now.

3. Q. Were there any double-acting brakes in use on that road at or after the time you first went into their employment?

A. I remember well when the order came out to put the double brake on when we overhauled the cars.

4. Q. Previous to their putting on these double brakes what kind of brakes had they used on the cars running in their passenger trains?

A. A brake that broke only on one truck—four wheels, with a single lever on the end of the truck toward the platform.

5. Q. What name, if any, to your knowledge, was the double brake they put on in the place of this single brake called?

A. I never paid much attention to the names of these brakes. It had a center lever.

6. Q. After they introduced this center-lever brake was there any better result produced by the use of it, as compared with the old single brake?

A. There was; a man could brake both trucks, where before he could brake only one.

7. Q. Was there any saving produced by it over the single brake? If so, in what respect?

A. It saved the wheels a great deal—the sliding of the wheels.

8. Q. Will you please state about how much longer the wheels lasted with the centre-lever brake than they did with the single brake?

1681 A. I think they lasted full as long again with the centre-lever brake as they did with the brake on one truck.

9. Q. Assuming that, with the centre-lever brake, one set of wheels upon an eight-wheel car would last a year, how many sets of wheels would be required to last the same time with the single brake? I am referring to passenger trains, and to wheels on the average.

A. It would take from two to three sets for the year.

10. Q. Will you please state what have been your opportunities of knowing about the wear of car-wheels since you have been in the employ of the New Jersey road?

A. I have most of the time since I have been in their employ had charge of the men engaged in taking the wheels out and putting them in, and it was done according to my instructions.

Cross-examined by M'r Whipple:

1. Cross q. When you made the application of the centre-lever brake to the cars of your road did you make any essential change in the mechanism of the brakes as applied to the trucks?

A. No, sir.

2. Cross-q. What did you do in order to convert the two single brakes of a car into a double brake?

A. I took and turned the truck so as to bring the lever, or that end of the truck, toward the center of the car, so that I could connect the rods to the centre lever under the centre of the car.

3. Cross-q. Any further connections than with the centre lever in order to complete the brake?

A. We have to connect the brake-shafts to the centre lever.

1682 4. Cross-q. Have you had anything to do with taking out wheels under freight cars? If so, how long a time did such wheels last, as a general rule, from the time they were first put in?

A. I have; and where there were no brakes on them I have known them to last six or seven years. The average of the wheels under brakes was about six months.

Redirect:

1. Redirect q. What was the average speed of the freight trains, the wheels of which lasted on an average six months?

A. About fifteen miles an hour; fifteen to twenty.

2. Redirect q. In stopping freight trains and passenger trains by brakes, in which are the brakes kept on the wheels longest?

A. In the freight trains.

JOHN P. VAN DOREN.

Adjourned to Tuesday morning, September 19th, at 10 o'clock.

Further adjourned to Tuesday morning, Sept. 26th, at 10.30 a. m.

TUESDAY, *Sept. 26th*, 1871.

HUMPHREY JACKMAN recalled on behalf of the complainant.

1. Q. While you were on the Concord & Nashua road did you see in use any other kind of double-acting brake than the centre cross-
1683 lever brake you have referred to in your previous examination?

A. I did.

2. Q. What was such other kind of double-acting brake?

A. It was what was called the two chains, or double-lever brake.

3. Q. Whereabouts in the car were the double-levers?

A. Under the car, over the trucks. Sometimes they are placed under the trucks.

4. Q. State how they were placed with reference to the body of the car.

A. I don't know as I could give you an exact answer. The two chains passed from one truck to the other on each side of the car. They are so connected wherever they are placed that they connect on the lever that has a fulcrum that is connected to the wheel or brake-wheel. I wish to state further that they are a brake I never adjusted or repaired. My knowledge of them is simply my observation—seeing them on the road.

5. Q. State whether these double-levers over the trucks, in this brake, were or were not cross levers.

A. I shouldn't be willing to say that they would be defined as cross-levers. They constituted a double-acting brake.

6. Q. I mean, did or did not these double-levers over the truck extend crosswise of the car?

A. They did. These levers leaned over the trucks, and connected with a lever running parallel with the car.

7. Q. You say you never adjusted or repaired this kind of double-acting brake on said railroad. Will you state here what kind of double-acting brake it was which you did adjust and repair there?

A. It was a brake with a centre or cross-beam running crosswise of the car at the centre of the car. One end of the cross-beam was attached to the brake by a chain or rod.

1684 8. Q. How was the other end of the cross-beam connected?

A. The other end was connected by a chain or rod to each one of the truck-brakes.

9. Q. State, if you recollect, any name by which this last mentioned brake was called?

A. I could not. I had forgotten the names of both brakes, it was so long since, till I heard them mentioned here.

10. Q. State whether this center cross-beam or cross-lever brake is the brake referred to by you in your previous examination here.

A. I should wish to make a full statement as regards that—as to my knowledge of it. My knowledge, the most of it, was from the merits of double-acting brakes on the wheels of the trucks. In the discussions the merits of the different machines was not brought into discussion, but the value of the brakes over the old single brake. My knowledge of the brakes was derived from argument with experienced men who were connected with the working of them.

11. Q. Question repeated.

A. It was.

12. Q. You spoke of it in your previous examination here as used on the Concord & Nashua road. Please state what knowledge you have as to whose cars it was that it was used on over the Concord & Nashua road.

A. There were nine roads that run their cars in there, and from them, being called out at different times when they had gatherings there in Concord, requiring more help than was usually employed, was where I got my information in regard to the different brakes—my knowledge. As to whose cars it was used on, I shouldn't wish to be understood as saying positively what roads the cross-lever brake was adopted on, or what cars. The cars of these different roads—these nine roads—
1685 ran over the Concord & Nashua road. I do not mean that the cars of all these roads had the cross lever brake; some of them did have.

13. Q. State whether these cars of these other roads which had this centre cross-lever brake ran over the Concord & Nashua road at the time you were on that road.

A. They did.

14. Q. Now, will you please repeat how it was that you came to see these said brakes on cars which had run over said Concord & Nashua road?

A. By being called out what we called privileged days—days of excitement—when there were more cars used than generally. I was called out to keep cars and engines in repair, in working order for the day.

15. Q. State whether or not you were so called out for the same purpose on other days than these "privileged days."

A. I have been in case of accidents and trying my engines.

16. Q. Now, please state all the means, both from your own personal observation or otherwise, which you had for making the statements contained in your previous examination here respecting the comparative wear of the wheels with the single brake and with the cross-lever brake.

A. My means were, coming in contact and being connected with men directly connected with the different branches of work bearing on the wear and durability of the wheels, and by being called out at these "privileged days" to keep the engines and cars in running order, and observing the effects on the wheels and machinery—all the running gear.

17. Q. In your previous examination here you stated that there was no difference in the holding power on the car-wheels of single brakes shod with iron and double brakes shod with iron. Please state more fully what you mean by this.

1686 A. I wish to convey the idea that it would have the same effect were they, both kinds, shod with leather or wood; that it would not make any difference.

18. Q. State whether or not you mean that as to the holding power on the wheels it would make no difference whether the single brakes or the cross-lever brakes were both shod with iron or were both shod with wood or leather.

A. I don't think it would. That is what I mean.

19. Q. State what difference, if any, would be produced as to the wearing of the wheels in the ratio of three to one by the single-acting brake in comparison with the double-acting brake, as stated by you in your previous examination, if both the single and double-acting brakes were shod with iron or both were shod with wood or leather.

A. I don't think it would make any difference.

20. Q. Please state whether, since you were examined here the other day, you have looked at any of the local freight-cars running on the Central Railroad of New Jersey.

A. I have.

21. Q. Did you see what kind of brakes any of the said local freight-cars had; if so, state whether they were single or double-acting brakes?

A. I did. They were double-acting.

22. Q. State, if you noticed, what railroad company's name was on said local freight-cars.

A. Central Railroad of New Jersey.

23. Q. Please state if you have ever noticed whether there is any difference between the effect of single-acting brakes and double-acting brakes in regard to the wear of the journal-brasses?

A. I have.

24. Q. Upon what kind of railroad carriages have you noticed this effect more particularly?

A. On the engine-tenders.

25. Q. With which kind of brake, the single-acting or the double-acting, is the wear of the journal-brasses the least?

A. The double-acting.

1687 26. Q. State about what, according to your observation, is the ratio of difference in this wear of the journal-brasses in favor of the double-acting brake, as compared with the single-acting brake.

A. I should say about one-half; the saving of the double-acting brake over the single in the wear of the brasses is two to one, to the best of my knowledge.

27. Q. Please state what have been your opportunities for obtaining knowledge on this subject.

A. I have direct charge of the repairs and building of the trucks and tenders. Up to within one year, for the last twenty or twenty-five years, that has been my opportunity of knowing.

28. Q. State what kind of brakes, whether single-acting or double-acting have been used on the locomotive tenders which have been under your charge for the said twenty or twenty-five years.

A. Single-acting brakes up to within ten years, or somewhere near that, and both since that time—single and double.

29. Q. Upon what railroads have said tenders, some having single and some double brakes, been under your charge during said period?

A The Central Railroad of New Jersey—for the last ten or eleven years.

30. Q. What kind of brakes, whether single or double acting, were in use on the tenders under your charge on the Concord & Nashua road and its connections?

A. The single brake.

Cross-examined:

1. Cross-q. What kind of double brakes are used on the tenders of the Central Railroad of New Jersey?

A. The single cross-lever.

2. Cross-q. What first called your attention to the difference, if
1688 any, between the wearing of the brasses in the trucks in which
the single brake is used, compared with those in which the double
brake is used?

A. I was connected in 1861 with the "patent antifriction metal box" owned by a man by the name of Devlan, P. S. Devlan, and I gave that my strict attention for the space of three or four years, to ascertain its value in all places where we could have a bearing, giving it its trial in the hardest places. There is where I found the wear that the double-connected lever had over the single.

3. Cross-q. Did you keep an accurate account of the wear of the brasses when used under the single brake, and the same account of like brasses when used under the double brake, as to the number of miles run and time run in each case?

A. We did not. We kept an accurate account of the wear and the mileage of the engines, but not with regard to keeping an account of the wear of the boxes, but it led to the finding out of the difference in the wear of the brasses between the single brake and the double brake.

4. Cross-q. Do you wish to be understood that the brasses used on the tenders of the engines of the Central Railroad of New Jersey, the trucks of which are controlled by the double brake, wear as long again as the same brasses would on the truck of the same engine where only the single brake is used?

A. I do. That is my judgment.

5. Cross-q. How much longer, if any, do the brasses on the truck of the tender that is not under the brakes wear compared with the truck in the same tender that is under the brakes?

A. The difference is about ninety thousand miles to forty thousand miles. Ninety thousand miles to the box on the truck which has no brakes to forty thousand to the box on the truck which has the brakes.

6. Cross-q. What is the difference in wear in miles as between the double brake and the single brake on tenders, in the matter of the wear-
ing of brasses?
1689 A. The brasses in the trucks with the double brake will run
about seventy-five thousand miles, and brasses in trucks with
the single brake will run about forty thousand miles.

7. Cross-q. How do you account for this difference in the wearing of brasses under the single and double brakes compared?

A. I account for the extreme wear of the single brake that it has the same work to do, the same power to hold, that the four sett does with the double acting. With the single-acting brake you wind up so hard that it creates a "chatter" or jumping motion of the wheels—sometimes will stop one while the other seems to jump along with an uneven motion. The double brake being all wound up will create the friction without being wound up so hard as to make an uneven motion.

8. Cross-q. Is not one of the wheels slid in one or both trucks while the others roll, even when the double brake is used on the tenders?

A. Yes, sir; they can be, and they do frequently slip.

9. Cross-q. When such is the case will it not have the same effect on the brasses?

A. It would.

10. Cross-q. Cannot the size of the windlass-wheel be so diminished, or the size of the part upon which the chain is wound so enlarged, that no more power could be put on one truck when the single brake is applied, than would be put on the same truck when the double brake is applied?

A. Certainly.

11. Cross-q. Would or not this diminution of the size of the windlass-wheel, or the increasing of the mandrel upon which the chain is wound, apply equally well to single brakes on cars as to single brakes on tenders?

A. It would.

1690 Redirect:

31. Q. Suppose the power exerted by a single-acting brake was reduced in the manner just inquired about, so that it was made to exert no more power on its truck than is exerted on one truck of a car which has the double-acting brake, would or not, in your judgment, such reduced power of the single brake be enough to stop the car efficiently?

A. It would not.

32. Q. How did you find out the difference in miles which you have stated the journal-brasses would run with the cross-lever brake as compared with the single brake?

A. I found out by keeping accurate accounts, in testing different kinds of boxes to ascertain their merits as wearing material.

33. Q. You have stated in your cross-examination that even when the double brakes are used on tenders, the wheels can be slipped and do frequently slip; with which kind of brake, the single brake or the cross-lever brake, do they slip the most often?

A. The single brake.

34. Q. What is this due to?

A. Sometimes it is due to irregular hanging, but as a general thing, to having too much power put on the brake-wheel.

35. Q. State whether or not, as a general thing, there is any more power applied to the single brake on tenders than is considered necessary by the person using the brake to do efficient braking?

A. No.

36. Q. State whether or not your last three answers apply equally well to passenger and other cars as to locomotive tenders.

A. I don't see why they would not; I should think they would.

1691 Recross:

12. Cross-q. To produce efficient braking of a car or tender, is it necessary that power enough shall be applied to slip the wheels?

A. It is not.

13. Cross-q. Then isn't there too much power applied when the wheels are slipped?

A. If there is no irregularity in the hanging there is.

34. Cross-q. How can the power be diminished so as not to slip the wheels, either with the double or the single brake?

A. By altering the fulcrum; enlarging the post on which the chain winds, or diminishing the wheel by which the brakes are wound up.

Redirect resumed:

37. Q. Was the effect of thus altering the fulcrum known to railroad men in the days when single brakes were used on cars, before any double-acting brakes were introduced?

A. It was.

38. Q. Did you ever see a single-acting brake, which had its fulcrum so altered from the ordinary mode of arranging such brakes that the power applied could not be made to slide the wheels?

A. I never did.

39. Q. If a single brake was so arranged that it never could apply any more power than as just inquired about, would or not, in your judgment, such a brake be capable of doing efficient braking in the present days of railroading?

A. I don't think it would.

Recross resumed:

15. Cross-q. Suppose the double brake was so arranged as in the last question, would it do efficient braking; that is, if it could not slide the wheels?

1692 A. It would do double the work that the single one would. I think it would do efficient braking under the circumstances inquired about.

16. Cross-q. Are the wheels slipped when used under the double brake?

A. They are sometimes.

17. Cross-q. Are they not often?

A. I suppose, of course, they are.

18. Cross-q. Then, in your judgment, it is necessary to have power enough to slip the wheels; is it or not to do efficient braking, whether the single or double brake is used?

A. It is not necessary; they never should be slipped.

Redirect resumed:

40. Q. Compared with the frequency with which the wheels are slipped when the single brake is used, would you say that they are slipped often with the double brake?

A. I would not in comparison.

Recross resumed:

19. Cross-q. Was it or not thought by those that had to do with brakes, when the single brake was used and before the double brake was introduced, that the most efficient braking was done when the wheels were slid, or "chocked," as it was called?

A. I presume it was considered so by the ignorant, but it was not among mechanics.

20. Cross-q. What was the resort of mechanics to prevent ignorant brakemen sliding the wheels?

A. A discharge of the brakemen. That was the penalty.

1693 21. Cross-q. Did you ever know of a mechanic diminishing the size of the windlass wheels by which the brakes are applied to prevent the brakemen sliding the wheels?

A. I don't know that I ever did.

22. Cross-q. Did you know of mechanics ever doing anything to prevent brakemen sliding wheels?

A. That has been a great study among mechanics; to arrange the leverage to equalize the power to the average strength of the men employed.

Redirect resumed:

41. Q. Which equalizes this power the most nearly; the single-acting brake or the cross-lever double brake?

A. The cross-lever double brake.

HUMPHREY JACKMAN.

Further adjourned to Friday, September 29th, at 10.30 a. m.

1694 **Friday**, *Sept.* 29*th*, 1871.

Luke F. Tronson, recalled on the part of the complainant, testifies as follows:

1. Q. In the eleventh question of your previous examination here, I asked you in relation to the general opinion, in respect of the effects of the cross-lever brakes, of the men in charge of the cars, and you answered about the opinion of a particular man—M'r William Pierson—who was foreman of the car shop. Will you now please state, if you know, what was the general opinion in respect of the advantages of the double brake over the single brake of the men, generally, in charge of the cars in the trains? State only what you knew about this matter at or soon after the time when the cross-lever brakes were substituted for the single brakes.

(Question objected to, as the witness has already stated that he had no personal knowledge, but can tell just what others told him about it; that is, as to the comparative merits of the single and double brakes in the matter of sliding wheels.)

A. The general impression among all the men was that the double brake was much the best, as it didn't slide the wheels; we had less trouble with it; the cars didn't have to go into the shop so often for repairs of trucks.

2. Q. What was the general opinion in regard to whether or not the wheels lasted longer with the cross-lever brakes than they did with the single brakes? State only what you knew at the time referred to.

A. The general opinion was that the wheels lasted longer.

1695 Cross-examined by M'r Whipple:

1. Cross-q. Had you conversation with any one but M'r Pierson on this particular subject—of comparison between the single brake and double brake in this matter of sliding wheels?

A. He was the only man I had conversation with that repaired the trucks in the shop.

Redirect:

3. Q. How were the men employed whose general opinion you referred to in your above answers?

A. Outside of M'r Pierson, the men were on the trains that I talked with—brakemen and conductors; he was the only man in the shop.

4. Q. State whether M'r Pierson is living or dead.

A. He is dead.

Recross:

2. Cross-q. Do you wish to be understood that you know nothing of this matter of sliding wheels, whether in the use of the single brake or the double brake, of your own personal knowledge?

A. I know that the wheels slid more with the single brake than with the double brake; I had more wheels to fit up in proportion; I fitted the wheels—it was done under me; I was foreman of the 'hop.

LUKE F. TRONSON.

Adjourned to Thursday morning, Oct. 5th, at 12 m.

Further adjourned to Friday morning, Oct. 6th, at 10 a. m.

1696 U. S. circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company.
In equity.

Testimony upon the accounting in the case, taken at New Haven, Connecticut, this 4th day of October, A. D. 1871.

ALLEN OSTRANDER, being duly sworn, doth depose and say, in answer to interrogatories proposed to him by S. D. Cozzens, esq., as follows, to wit:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Allen Ostrander; 54 years of age; residence, New Haven; and occupation, yard-master on the New York and New Haven Railroad, at New Haven.

Q. 2. How long have you been employed on the New York and New Haven Railroad?

A. Twenty-two years, I believe.

1697 Q. 3. At the time you first went into the employ of the New York and New Haven Railroad Company, what did you do for them?

A. I worked at repairing of cars and examining cars.

Q. 4. What kind of cars, passenger or freight, or both?

A. Both.

Q. 5. About how long a period were you engaged in repairing and examining cars?

A. About eighteen or nineteen years.

Q. 6. At the time you were first employed by the New York and New Haven Railroad Company, what kind of brakes were used on the cars running in their passenger-trains?

A. Single brakes—one on each end of the car.

Q. 7. At any time after you entered their employ was any change made in the brakes used on their cars; and, if so, what change?

A. Yes, sir; there was a change in them from the single to the double brake.

Q. State what kind of a lever or levers the brake to which they so changed had under the centre of the car, if any.

A. It was a single lever under the centre of the car; that was the first change.

Q. State whether or not this lever extended crosswise under the car.

A. It was crosswise under the car.

Q. 10. After this centre-lever double brake was put on to the cars, was there any improvement in the length of time which the car-wheels wore?

A. I do not know how to answer that; we never made a thorough test.

Q. 11. State, from the observation and experience which you had of the matter, whether or not the car-wheels lasted longer after this centre-lever double brake was put on than they did before.

A. Well, they will wear longer.

1698 Q. 12. Stating from your best judgment, about how much longer will the car-wheels wear with such a double brake than with a single brake? Give us your best judgment.

A. Well, I should think they would wear nearly, if not quite, three times as long.

Q. Do you know about how long the wheels under freight-cars which have double-acting brakes upon them wear, as compared with freight-car wheels under the same circumstances, with the single brake? Give us your best judgment.

A. If they are used the same I do not see why there would be any difference between the freight and passenger car wheels.

Q. 14. Do you mean no difference as to the proportional length of wear of the car-wheels between the single-acting brake and the double-acting brake?

A. Using the freight and passenger cars with the same brake, I don't see why they would not last the same on the freight as the passenger car.

Q. What I want to get at is whether you mean that there would be the same proportionate difference in the wear of the wheels between the single and double acting brake on the freight-cars as on the passenger-cars?

A. There would be the same difference under the freight as under the passenger car with the same use, I should think. As I have never tried it, I would not say positive.

Q. 16. While you repaired and examined cars on the New Haven road, did the wheels of the freight-cars, as well as the passenger-cars, come under your observation?

A. They did in repairing, but in examining cars I was more particular on the passenger-cars.

Q. 17. State whether this repairing of the freight-cars gave you an opportunity of observing the effects of the brakes used on those cars, on the wheels, as to the wearing of them.

1699 A. Yes; for I used to take out and put in the wheels, as well as repair the wood-work.

Q. 18. State whether you based your above answers about the wear of the freight-car wheels upon this experience which you say you have had with wheels on the New York & New Haven road?

A. Yes, sir.

Q. 19. What kind of brake, whether double-acting or single-acting, is used at present on the freight-cars of the New York & New Haven Railroad?

A. Double-acting brakes are used. We have no single brakes.

Q. 20. About how many years have they used double-acting brakes on their freight cars on that road?

A. It must be eighteen or nineteen years; I can't say exactly; it may be longer, it may be less.

Q. 21. Do you know about how many freight cars the New York & New Haven Railroad has?

A. I think there are nearly five hundred; between four and five; I can't say exactly how many.

Q. 22. State whether or not on said road they use the double-acting brake on their "flat," or "platform," freight cars, as well as on their "box" freight cars?

A. They use the double-acting brake on all cars. We have no single-acting brakes on the road.

Q. 23. Is the New York & New Haven road what may be termed a first-class railroad?

A. Yes, sir.

Q. 24. Do you know about what is the average life of the car-wheels running on the passenger-trains on the New York and New Haven road, taking one wheel with another?

A. I should say about a year; some wear longer and some not so long.

Q. 25. Do you remember within your experience any cases where wheels under freight cars which appeared to be new had been "flatted"
by the application of single brakes?

1700 A. Yes, sir; I have seen wheels which appeared to be new,
looked as if they had run but a few days, and were "flatted" so
that they were not fit to run, not safe to run.

And in answer to cross-interrogatories proposed to him by S. M. Whipple, esq., he saith:

Cross 26. What brakes are in use on the tenders on the New Haven road, single or double?

A. I don't know; I think they are single. When I answered the other questions I had reference to passenger and freight cars, not to tenders.

Cross 27. Have you had occasion to take out wheels from the tenders of locomotive engines?

A. No, sir; I never had anything to do with the engine department.

Cross 28. Is the centre lever double-acting brake now in use on the passenger and freight cars of the New Haven road?

A. No, sir; I don't know of any on the road.

Cross 29. What double brake is used?

A. The Hodge brake; that has two levers.

Cross 30. What brakes are in use on the freight cars of the New Haven, Hartford and Springfield road, which runs in connection with the New York and New Haven road?

A. I don't know whether they are the Hodge brake or the single brake. As I don't have anything to do with their freight cars, I don't know whether they have the single brake or the Hodge brake, or some other. They may have some other; I don't know.

Cross 31. Why do the wheels wear longer when under the double brake, as you say they do, than when used under the single brake?

A. Because the leverage is put on to eight wheels instead of four.

Cross 32. May not the leverage be so reduced on the single
1701 brake, that is to say, may not the diameter of the windlass wheel
be diminished or the shaft on which the chain winds be so enlarged that the power would be the same on the wheels of one truck, as it is now on the wheels of each truck in the use of the double brake?

A. It could be reduced so as to make it the same, and so that it wouldn't hold at all; it wouldn't hold the cars.

Cross 33. Could it be reduced so that it wouldn't hold at all in the case of the double brake?

A. I suppose it could.

Cross 34. Have you any doubt that it could?

A. You could make the wheel so small that you couldn't turn it hard enough to do any braking; but I do not know what they would do that for.

Cross 35. What applies to the diminution of the size of the windlass to the double brake, does it not equally apply to the single brake?

A. I should hardly think it would in the same proportion.

Cross 36. Why not?

A. Because you have the wheels that you are braking on nearer together; you wouldn't have so long a rod to draw on braking on one truck as you would on two.

Cross 37. Are the wheels any nearer together whether you brake one truck or both trucks?

A. Yes. They are not any nearer together in the truck, but when you are using the double brake the other truck is further away and you have a longer rod to draw on.

Cross 38. Assume that a ten-inch windlass wheel is used to apply the single brake and a thirteeen or fourteen inch wheel to apply a double brake, do you think there would be so great a difference in the wear of wheels as you have stated in your direct examination ?

A. They can reduce the leverage of the single brake so that it wont hold any harder nor so hard as the double brake if they want to.

1702 Cross 39. In case of such reduction, do you think the difference in wear between the two brakes would be so great as you have stated ?

A. No, if they did it; but they don't. I never saw them reduced so much as that. Here, we used the same windlass wheel when we put on the double brake as we did when we used the single brake.

Cross 40. Did you ever keep an account of the time that wheels run under the single brake, and also the time which they run under the double brake, so as to enable you to institute a comparison between the two brakes in the matter of wearing wheels ?

A. I never kept a regular account. I never made a regular test of it, as I have heard they have done on other roads, but I have noticed that wheels had not been slid as much to flatten since we have used the double-brake as they did before.

Cross 41. What have you heard of being done on other roads in the way of keeping an account, and from whom have you heard it ?

A. I heard that they kept a regular account at one time on the Hudson River road. That was M'r Sayles told me that. I don't know what his first name is.

Cross 42. Was it the man who first saw you in reference to taking your testimony in this case ?

A. Yes, sir.

Cross 43. What did he state to you as the result of this account kept on the Hudson River road ?

A. That the wheels under the double-acting brake would last four times as long as the wheels under the single-acting brake. I think he said that, but I wouldn't be sure whether it was three or four times.

Cross 44. Did M'r Sayles state to you what other witnesses had testified to on this point of the comparative wear of wheels under the single and double brake ?

A. No; I believe not.

1703 Cross 45. Assume that the New Haven, Hartford and Springfield road are using single brakes on their freight cars, is it your opinion that that company is destroying three sets of wheels by the use of the single brake as against one set used under the double brake by the New York & New Haven road which runs in connection with the aforesaid road ?

A. Well, I think if they used the single brake where we do the double brake on the New York and New Haven road, they would wear out more wheels.

Cross 46. Do you think that they would wear out three sets of wheels by the use of the single brake as against one set on the New York road ?

A. Well, I don't know as they would on their road, for their road is shorter, and there are fewer stations on it, and there would consequently be less braking.

Cross 47. Suppose the roads were of the same length, and had the same number of stations, do you think the Hartford and Springfield road would wear out three sets of wheels as against one set by the New Haven road?

A. Well, as I said before, not having tested it, I think they would wear out three sets to one on the New York road; but not having tested it, I would not swear to it, but I should think they would wear out three to one.

Cross 48. Will you swear to the same—in reference to the same—with reference to the passenger and freight cars on the New Haven road, or did you merely state it as your opinion?

A. I state it as my opinion.

Redirect:

Q. 49. Suppose the leverage of the single brake was reduced, as inquired about on the cross-examination, do you think that the brake would do efficient braking under the circumstances which occur practically on railroads?

1704 A. Well, if you should reduce the leverage on a single brake so that it is less than it is on the double brake when the double brake's leverage is just right, the single brake's leverage would be too small to do service.

Q. 50. Do you think that when the leverage on the single brake is reduced, as suggested in the cross-examination, it would be too small to do service?

A. I think it would have hardly power enough to do service, but I wouldn't swear. I never saw the attempt made. I think I never saw so small a wheel used on the windlass.

Q. 51. Have you based your answers in this deposition upon your own observation with respect to car-wheels, or upon what M'r Sayles may have told you?

A. I have spoken principally from what I have seen with respect to wear of wheels.

Recross:

Cross 52. To produce efficient braking of a car, is it necessary to slide the wheels?

A. No, sir; it doesn't hold so well when the wheels are sliding as it does when the wheels are just rolling a little.

Cross 53. May not the leverage of a single brake be so graduated as to do efficient braking, and not slide the wheels?

A. I think it may.

ALLEN OSTRANDER.

1705 Hebron T. Douglass, being duly sworn, doth depose and say, in answer to interrogatories proposed to him by S. D. Cozzens, esq., as follows, to wit:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Hebron T. Douglass; age, fifty-three years; residence, New Haven. Am not engaged in any business at present; have been car-master on the New York and New Haven Railroad.

Q. 2. About how long were you in the employment of the New York & New Haven Railroad Company?

A. A little over seventeen years as car-master, and between two and three years previous to that as a journeyman.

Q. 3. While you were car-master on the New York & New Haven road, what were your duties?

A. My duties were to build, repair, and the general oversight of the cars; had charge of the shop; was superintendent of the car department.

Q. 4. State whether taking out old wheels from the cars and putting in new ones came within your department.

A. It did.

Q. 5. How long since you left the employ of the New York & New Haven road?

A. Something over two years.

Q. 6. When you first went into the employ of said railroad, were there any brakes in use on their cars of the kind known as single-acting brakes?

A. There were some, to the best of my recollection.

Q. 7. Were those single brakes taken off at any time while you remained in their employ; and, if so, what was substituted for them?

A. All that were on while I was in their employ were taken off, and the double-acting brake put on.

Q. 8. Do you know what name these double-acting brakes which were put on went by?

1706 A. There were, I think, three kinds of double-acting brakes tried at different times—Tanner, Hodge, and Stevens.

Q. 9. Which one of these double-acting brakes was first used on the New York & New Haven road?

A. The single lever in the centre of the car—I think the Tanner.

Q. 10. While you were car-master on said road did you see the cars of other railroads, with single brakes upon them, come over the New York & New Haven road?

A. Yes, I did.

Q. 11. While you were so car-master did it come within your duties to notice the wear produced on the wheels by the use of single-acting brakes, and also by the use of double-acting brakes?

A. Yes; it did.

Q. 12. Will you state whether, in your judgment as a railroad man and a car-master, the car-wheels, under given circumstances, will wear any longer when such a double brake as the Tanner brake is used than they will when the single brake is used?

A. I do think they wear longer.

Q. 13. In your judgment, about how many sets of wheels would be required—in say a year—for a passenger car using the Tanner double-acting brake, and how many for the same car, in the same time, if the single brake be used?

A. It would take, with the Tanner brake as we used to use them on that road, a little over one set of wheels a year. I presume it would take three sets using the single brake.

Q. 14. You say "presume." What is your judgment?

A. That is my judgment.

Q. 15. Do you think, taking the weight of cars and speed of trains as they are at the present day, that the single-acting brake could be used with safety on passenger-trains, as a general thing?

A. I do not.

1707 Q. 16. Will you please state, if it is within your knowledge, what kind of brakes are used on both the "flat" and "box" freight cars of the New Haven and Northampton Co., commonly called the Canal Railroad?

A. It is the Hodge brake, double acting.

Q. 17. Will you also please state, if you know, what kind of brakes are used on the freight cars of the Housatonic Railroad, Nagatuck Railroad, Danbury & Norwalk Railroad, and Shore Line Railway?

A. I think they all use the Hodge brake, double acting.

Q. 18. How many of the railroads named in the last two questions are what may be called first-class railroads?

A. They are all good roads.

And in answer to cross-interrogatories proposed to him by S. M. Whipple, esq., he saith:

Cross 19. What kind of brakes are used on the freight equiyment of the New Haven, Hartford and Springfield road?

A. I think they use mostly, if not altogther, the single brake on that road.

Cross 20. What other roads in the United States are using the single brake on their freight equipment?

A. The Boston & Albany use, I think, the single brake, and I think the Rutland & Burlington. Quite a number of those Northern and Eastern roads use them, but I am not acquainted with them all.

Cross 21. So far as your knowledge extends, is not the single brake used on freight cars with the exception of those named in your direct examination?

A. No. I know of other roads that use the double brake on their freight cars.

Cross 22. What other roads?

1708 A. The New York & Harlem. I think the New York Central use the single brake on their freight cars.

Cross 23. Is it your judgment, as a railroad man, that railroad companies, by using the single brake instead of the double brake on their freight cars, are destroying three sets of wheels per year by so doing, as against one set, or thereabouts, if the double brake were used?

A. That would be my judgment.

Cross 24. Upon what do you base such judgment?

A. From observation.

Cross 25. What has been your observation with reference to the matter inquired of?

A. My observation perhaps has been as much of cars of other companies that came into the yard here with the single brake on. I have noticed car wheels come into the yard here—you can't tell by the looks of wheels just how far they have run—but apparently new wheels—that had been slid or worn flat with the single brake till they were not safe or fit to run at quick speed.

Cross 26. Have you not observed the same in cars when the double brake was used?

A. Not to the same extent; I have to some extent, a little flat spot.

Cross 27. Have you ever kept any record of the wear of wheels when used under the single brake, and also under the double brake, and compared the result one with the other?

A. I have not.

Cross 28. Is there any way known to you whereby you can so modify the leverage, whether as applied to the single brake or to the double brake, so as to, in a great measure, prevent the sliding of the wheels?

A. Oh, you can prevent the sliding of the wheels. You can reduce your leverage so as not to slide your wheel.

1709 Cross 29. Can this be done practically in either case—that is, with the single or double brake?

A. It could with the double brake, and so it could with the single, but not so as to make it (the single brake) a very efficient brake.

Cross 30. Please explain why your answer applies to the double brake and not to the single brake?

A. To begin with, I don't think the single brake a very efficient brake any way.

Cross 31. Is any brake, in your judgment, an efficient brake, whether single or double, that has not sufficient leverage to enable the brakeman to slide the wheels?

A. Yes.

Cross 32. Do you know of any double brake the leverage of which is so arranged that the wheels are not slid more or less?

A. No; I do not know that I do.

Cross 33. Then is it not necessary that any brake should have the resident force in it to slide the wheels in order to be efficient?

A. No, I don't think it necessary to slide the wheels in order to make an efficient brake. I will add that under some circumstances, viz, when the track is wet, a brake will cause a wheel to slide much easier than when the track is dry.

Cross 34. Do you think wheels are slid as readily, whether the single brake or the double brake is used, since the adoption of iron for brake shoes?

A. No, I don't think they are slid as readily.

Cross 35. Would not this fact somewhat modify your judgment as to the margin between wheels worn out under the single brake, compared with the double brake?

A. No, I don't think it would, as I notice that on a number of the roads where they use the wood shoes yet.

1710 Cross 36. On what roads?

A. I think they do on the Boston and Albany; I would not swear to that, for I haven't noticed very much about their cars within the last two years.

Redirect:

Q. 37. About how long ago was iron adopted on the cars of the New York and New Haven Railroad for the shoeing of the brakeheads?

A. Well, I should say fifteen or eighteen years ago.

Q. 38. About how long ago was iron adopted for this purpose on the cars of some or all of the roads connecting with the New York and New Haven road and the cars of which you used to see come over the latter road?

A. When I left the New York and New Haven road iron was not used on all the cars of other roads which ran over that road; it was adopted on some of them ten or twelve years ago.

Q. 39. State whether you ever saw any reason to change your opinion as to the relative wear of the car-wheels as between the single brake and the double brake after such adoption of iron for the brake shoes?

A. I do not know as I have.

Q. 40. You were asked, on cross-examination, whether you ever kept an account of the wear of the wheels with the single brake. Will you state whether you consider it necessary to have kept such account to enable you to form the judgment you have given in this testimony?

A. No, I don't think it is necessary.

Q. 41. You stated that you had noticed some little flat spotting of wheels in cars which had the double brake. Please state what form of double brake the cars you referred to had—the Tanner, Hodge or Stevens?

A. The Hodge—perhaps more from the fact that I had more to do with them.

1711 Q. 42. Assume that a car with a single brake had its leverage reduced as inquired about on the cross-examination, so that the brake could not under any circumstances slide the wheels, would or not a brake having no more power at any time than that be, in your judgment, an efficient brake for practical use?

A. I should not think it would, in my judgment.

Q. 43. Suppose a single brake is so adjusted that the power which it exerts upon its truck is no greater at any time than the power exerted by a double brake upon each one of the trucks, would or not, in your judgment, the greater number of points of simultaneous fractional contact in the case of the double brake affect materially the question of the efficiency of such double brake as compared with such a single brake?

A. Well, of course, as I understand it, it would be two to one.

Q. 44. Please state whether or not this fact constitutes an important reason why the double brake can do its work without requiring power enough to be applied to slide the wheels, and thereby "flat" them and spoil them, even though it has such reserve power in it, when, as ordinarily used, the single brake cannot?

A. It is.

Re-cross:

Cross 45. Assume that a car with a double brake has its leverage reduced so that the brake could not under any circumstances slide the wheels, would or not a double brake, having no more power at any time than that, be in your judgment an efficient brake for practical use?

A. No, I do not think it would.

Redirect:

1712 Q. 46. Would or not such a double brake as just inquired about be more efficient than a single brake, which could not under any circumstances slide the wheels?

A. It would, I think, in proportion two to one.

H. T. DOUGLASS.

UNITED STATES OF AMERICA,
District of Connecticut, ss:

I, Jonathan Ingersoll, a commissioner duly appointed by the circuit court of the United States for the district of Connecticut, under and by virtue of the act of Congress "for the more convenient taking of affidavits and bail in civil causes depending in the courts of the United States," passed Feb. 20th, 1812, do hereby certify that the reason for taking the foregoing depositions is, and the fact is, that the testimony of the witnesses aforesaid is necessary in the cause in the caption of the said depositions named.

And I further certify that on the 4th day of October, in the year of our Lord one thousand eight hundred and seventy-one, I was attended by S. D. Cozzens, esq., counsel for complainant, and by S. M. Whipple, esq., counsel for respondents, and by the said witnesses; and each of the said witnesses was by me first carefully examined and cautioned and sworn to testify the whole truth, and the testimony by them given was by me reduced to writing, and thereafter subscribed by the said witnesses in my presence.

And I further certify that I am not of counsel or attorney to 1713 either of the parties, nor in any way interested in the event of the cause named in the caption.

In testimony whereof I have hereunto set my hand and seal this 4th day of October, in the year of our Lord one thousand eight hundred and seventy-one, and of the Independence of the United States the ninety-sixth.

JONATHAN INGERSOLL,
United States Commissioner for the District of Connecticut.

FRIDAY, *Oct. 6th*, 1871.

FREDERICK NEVIUS, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Frederick Nevius; age, thirty-three; residence, Jersey City Heights; occupation, car-inspector.

2. Q. Are you in the employ of any railroad company; and, if so, of what company?

A. I am. The New Jersey Railroad Company.

3. Q. How long have you been in the employ of that company?

A. Four years next June.

4. Q. In inspecting cars for that company, do you have charge of any particular trains; if so, what trains?

A. I do; of the New York and Washington through line.

5. Q. Have you had charge of the cars in this through line during the whole of the time you have been in the employ of said company?

A. I have not.

6. Q. For about how long have you had charge of said through-line cars?

A. I think it is nearly three years.

7. Q. In inspecting the cars of said line, what kind of duties do you have to perform?

A. I have to examine the wheels; examine every bolt and nut on the cars to see that they are properly screwed up, and repairing to be done on them; I have to see that it is done. If I can do it myself, I have got to do it. I have to keep the cars in running order.

8. Q. State whether or not these duties of yours, with regard to these cars, require you also to examine and keep in repair the brakes on these cars?

A. They do.

1715 9. Q. What kind of brake is used upon the cars in said through line furnished by the Camden & Amboy and New Jersey Railroad Companies?

A. The centre-lever brake.

10. Q. What kind of brake is used on the cars in said line furnished by the Philadelphia, Wilmington & Baltimore Railroad Company?

A. A long rod brake; the Stevens patent.

11. Q. Do the above duties which you have spoken of as performed by you about the cars of this through line, enable you to know when the wheels of the cars are too much worn to run properly?

A. They do.

12. Q. State whether you find any difference in the wearing of the car wheels in this through line between the said cars having the Stevens brake and the cars having the centre lever brake.

A. I have been thinking of that since I was asked the question awhile ago, and I think the wheels with the center-lever brake wear out the fastest. I have nothing to go by only my memory.

13. Q. About how long, according to your observation, do the wheels of the cars in said line with the center-lever brake wear on the average?

A. From ten months to a year.

Cross-examined by M'r Whipple:

1. Cross q. How long do they last on cars that have the Stevens brake on?

A. A year and a half.

FREDERICK NEVIUS.

1716 FREDERICK NEVIUS, recalled on behalf of the complainant:

1. Q. In speaking above of wheels which lasted a year and a half with the Stevens brake, what kind of wheels did you refer to?

(Objected to, as the witness has been taken from the stand and conferred with and recalled.)

A. I referred to steel wheels.

2. Q. Referring now to the regular cast-iron wheels of the cars in said through line which have the Stevens brake, and the regular cast-iron wheels of the cars of the New Jersey road in said line having the center-lever brake, please state which wear the longest, or whether you find any difference in the wear of them.

A. I can't say that I see any difference.

Cross:

1. Cross-q. Which brake distributes the power exerted by the brakeman on the wheel more equally, the Stevens brake or the center-lever brake?

A. That is pretty hard for me to answer, as I am not a brakeman. My impression is that the center-lever brake does.

2. Cross-q. Do you have the taking out and the putting in wheels at Jersey City of the cars of the Philadelphia, Wilmington & Baltimore road, which have the Stevens brake?

A. I do of the cars belonging to the Washington line; that is, I help to.

3. Cross q. Do you take them out from cars belonging to that company to the same extent that you do from the cars of the New Jersey and Camden and Amboy Companies in that line?

1717 A. It is only incidentally—as I have occasion.

4. Cross-q. When the cars need renewal of wheels, are they as a general rule sent to the shops of the company at Wilmington for this purpose?

A. Just as it happens about that; if they want a whole set they do. It is just as it happens; we have put in whole sets here.

5. Cross-q. Where are the wheels of this company more generally put in—at Wilmington or at Jersey City?

A. Just as it happens. If they want them at Jersey City, and there are no other repairs, they put them in. If there are other repairs besides wheels, they send them to Wilmington.

If they have got the wheels they put them in at Jersey City; if they haven't got the wheels, they send them to Wilmington.

FREDERICK NEVIUS.

PATRICK S. DEVLAN, recalled on behalf of the complainant:

1. Q. For about how many years of the time you were practically employed upon railroads, as you stated here the other day, were you engaged as locomotive engineer?

A. About fifteen years.

2. Q. During about how many years of this fifteen were you engineer of passenger trains the cars of which had single brakes on them?

A. The greater part of the time; I can't state exactly.

3. Q. State how the fact was as to whether the reversing of 1718 the locomotive, under steam, was generally relied upon to aid in stopping trains in the days when single-acting brakes were used on the passenger-cars.

A. It was.

4. Q. State whether such reversing of the engine under steam is, or not, dispensed with since the double-acting brake—whether the centre-lever brake or any other kind of double-acting brake—has been introduced upon railroads.

A. It is dispensed with.

5. Q. Please state what is the effect upon a locomotive of reversing it under steam.

A. It would be under a full head of steam or under general headway, a racking of the engine.

Cross-examined by M'r Whipple:

1. Cross-q. In what year did this fifteen years of your service as engineer commence, and on what road?

A. In 1835; on the Tamaqua road.

2. Cross-q. Was it on this road that you were in the habit, as an engineer, of reversing the engine to stop the trains, or on some other road or roads?

A. On that road and others both. On the Harrisburgh & Lancaster, also what was called at that time the Columbia road, Lebanon Valley, and the Philadelphia & Reading road.

3. Cross-q. Was this reversing of the engine to stop the train done in any other cases than those of emergency?

A. It is a hard question to answer. I have reversed an engine and slid all the wheels in a train for thirty or forty yards; that was a very frequent thing. It was not as a general rule.

1719 Redirect:

4. Q. You have said above that when the single brake was used on passenger-trains, the reversing of the engine was generally relied upon to aid in stopping the trains. I now understand you to say that this reversing was not done except in cases of emergency. Will you please explain what you mean?

A. It was always relied upon, the reversing of the engine to stop the trains, with the single brake. I did not understand the third cross-question. It was a general rule always to reverse the engine.

Recross:

4. Cross-q. You say you have reversed an engine and slid all the wheels on a train for thirty or forty yards; does reversing the engine slide the wheels of the cars in a train?

A. No. I meant the wheels of the tender, and the driving-wheels of the engine revolving the contrary way.

5. Cross-q. Does the reversing of the engine have anything to do with sliding the wheels of the tender?

A. No, sir. The brakeman, or the fireman I should say, always applied the brakes to the tender the instant the engineer reversed.

6. Cross-q. Did you reverse the engine at all stopping-places or stations as a general rule?

A. Yes; always.

7. Cross-q. What effect did this reversing have on your engine?

A. If it was so severe that the wheels revolved the other way, it wore the tire very much. We generally gave it steam when we reversed, and it strained the other parts of the machinery.

1720 8. Cross-q. How long would an engine run with this constant reversing and straining of machinery before it would have to go into the shop for repairs?

A. As a general rule, that I can't answer. Some would be out a week, some three months; that would depend upon circumstances.

9. Cross q. Were the cars used single-truck cars in trains run by you in the early time of your railroading?

A. Yes; first part single and latterly double.

10. Cross-q. Do you allude to single-truck cars when you speak of reversing the engine to stop the train?

A. I allude to the four-wheel cars. There were no trucks, nothing like a truck, when I commenced. I allude to both four-wheeled and eight-wheeled cars. When I commenced they had nothing but four-wheeled cars. They afterwards got the trucks.

11. Cross-q. After the application of the double brakes to cars, did you reverse the engine to stop the train in cases of emergency?

A. In cases of extreme emergency we did—in danger of collision or anything of that kind; running over anything—but not as a general rule.

P. S. DEVLAN.

CYRUS W. BURTON, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Cyrus W. Burton; age, fifty one; reside in Bridgeport, Conn.; occupation, locomotive-engineer.

2. Q. Are you at the present time employed on any railroad; if so, what railroad?

A. I am; on the Morris and Essex Railroad.

1721 3. Q. Have you been employed on any other railroads than that as locomotive engineer; if so, what roads?

A. I have; on the New York and New Haven Railroad, and the Pennsylvania Central.

4. Q. About what year, as near as you can recollect, did you commence running as locomotive engineer on the New York and New Haven road?

A. About 1849.

5. Q. For about how many years did you continue to run on said road as locomotive engineer?

A. Seventeen.

6. Q. At about the time, and for a while after you commenced to run on the New Haven Road, what kind of brakes, whether single-acting or double-acting, did they use on the cars running in their passenger-trains?

A. What is termed the single brake; that is, attached to one truck.

7. Q. In those days, when they used the single-acting brake on their passenger-trains, did the engineer do anything to aid in stopping the trains at stations; if so, what did he do?

A. If the brakes did not hold, the engineer reversed the engine to stop the train at the point he wished to stop at the station.

8. Q. Taking one day with another, about how much of the time did the

engineer have to reverse his engine to aid in stopping the train when the single brakes were used on the cars?

A. About half the time.

9. Q. While you continued to run upon the New Haven road as locomotive engineer, was there any change made in the brakes used on their cars; if so, what was the change?

A. Yes, sir; the change was from what we termed the single brake to the double brake; that is, a brake attached to both trucks, the forward and rear trucks of the car.

1722 10. Q. After these double brakes were introduced on said road, what kind of trains did you run on as engineer?

A. Passenger, both "way" and express. "Way" trains stop at all the stations; express, at a portion of them.

11. Q. About how many cars were there in those express-trains?

A. The average express-train would be about ten or twelve cars.

12. Q. Were there any of those express-trains at any time which had more cars?

A. Yes, sir.

13. Q. How many more?

A. Well, it depended on the travel. The average was, as I have stated, ten or twelve cars. Sometimes, for a quarter of the time, they would run up to sixteen or eighteen.

14. Q. With these heavy trains of more than ten or twelve cars, did you have to reverse your engine in stopping at stations; and, if so, about how often, say in a month, after they used the double brake on the cars?

A. No, sir; it hardly ever occurred that we had to reverse the engine at the stations; not once in six months.

15. Q. What is the effect on the engine of reversing it while under headway?

A. Well, the effect is injurious to the engine in reversing it.

When you reverse your engine with steam on it, you have the whole power of the engine going one way, and then when you put on the steam the other way, it throws the steam back into the boiler, and the effect on the engine is to rack every bolt and nut in it, as if you struck it with a sledge-hammer.

16. Q. How much longer do you think an engine can run without having to go into the shop for repairs, when it doesn't have to be reversed under steam any oftener than you have stated it does
1723 when the double brake is used, than it could if it had to be reversed as often as when the single brake was used? State to the best of your opinion.

A. My opinion is that it would run one-third longer without reversing than when it was; one-third longer when it did not have to be reversed than when it did.

17. Q. Please state how the fact is as to the small repairs, such as would be done in the round-house without sending the engine into the shop, when the engine is not reversed any oftener than is required with the double brake as compared with what it would be with the single brake.

A. It should run twelve months without reversing, except the round-house repairs. As to round-house repairs, it would make very little difference as to that, as there would be only what one man could do in the round-house. With the reversing, it would have to go into the shop in about eight months; without reversing, in about twelve months, making about one-third difference, as I stated.

Cross-examined by M'r Whipple:

1. Cross-q. How many brakemen were employed on the passenger-trains on the New Haven road run by you, as a general rule, when single brakes were used?

A. As a general rule one to three cars.

2. Cross-q. What number, as a general rule, were employed when they used the double brake?

A. The same number.

3. Cross-q. Had there been placed a brakeman at each car in the train or between every two cars do you think there would have been any necessity of reversing the engine to aid in stopping the train when single brakes were used?

1724 A. The cars we were running at that time had the single brake on only one end, and if you wanted to get to the brake of the next car you had to pass through the car. This was sometimes the case when the ends of the cars having the brakes on didn't come together.

4. Cross-q. Assume that the single brake is applied to each truck of the car or cars of the train, would a brakeman between every two cars in a train so control the train as to render the reversing of the engine unnecessary?

A. It is my opinion he would not.

5. Cross-q. At what time did the New Haven road run on an average ten or twelve cars in its passenger-trains?

A. I don't mean to say that every passenger-train had that, but many of them since in 1850.

6. Cross-q. What, in your judgment, would be the average, taking all passenger-trains through the year, both local and express?

A. It would be impossible for a man who hadn't a report of the trains—the number of cars in the trains—to say.

7. Cross-q. Is it equally as impossible for you to state that an engine would run twelve months drawing trains in which the double brake is used before it would have to go into the shop for repairs, compared with an engine drawing trains upon which the single brake is used having to go into the shop for repairs in eight months on account of reversing the engine?

A. No, sir. In my experience an engine will run twelve months before going into the shop without reversing, as it would go into the shop with reversing in eight months. That is what I mean, that an engine will run better twelve months without reversing than it will eight months with reversing.

8. Cross-q. Every time you reversed your engine did you throw it completely over and reverse the driving-wheels or slide them upon the rail?

1725 A. When we reversed an engine we threw it clear over, but owing to the difference of the rail being wet or dry—on the dry rail the wheels do not always slip or slide—the damage was greater to the engine for not slipping than if they did. I mean by that that they do not always turn backwards.

9. Cross-q. Do you wish to have it understood that you reversed your engine at every other station that you had to stop at on an average; if not, what do you wish to be understood?

A. I mean to say that we reversed the engine at half the stations in going over the road.

10. Cross-q. Was not this reversing of the engine in a great measure owing to the fact you have already stated, that the cars had brakes only on one truck of a car, and not on two trucks, as is usually the case?

A. That is what we were obliged to do, with the brakes on only one end, to stop the train; if they had brakes on each end of the car, and all the brakes been applied, there would have been no necessity of reversing the engine to stop the train, that is, if they were applied at the proper time.

11. Cross-q. Were you running a passenger-train at the present time equipped with double brakes, and you were likely to run by a station, would you reverse your engine to prevent your so doing, or would you wait till the train stopped and then reverse and back up?

A. I should reverse my engine and stop, if my brakes failed.

12. Cross-q. Do you now reverse your engine at stations if you see that you are likely to run by the place where you want to stop?

A. I think I said in answer to the other question that if it occurred I did.

13. Cross-q. Does it occur on the road you are now running on?

A. It has once in three months.

1726 14. Cross-q. Do you say that you have run a passenger-train three months, and only run by a station once in that time?

A. I say that I have reversed my engine but once at a station in three months, for receiving and discharging passengers.

15. Cross-q. Do you mean by that that you have not run by a station for receiving and discharging passengers but once in three months?

A. I do, so as to be obliged to back up.

16. Cross-q. How many cars in such trains, and how many brakemen in the three months spoken of?

A. Six or seven cars, and two brakemen.

17. Cross-q. Would not, in your judgment, the result been the same if you had had the single brake on the same cars and four brakemen working and operating the brakes simultaneously?

(Objected to as it might be impossible for four brakemen to apply all the brakes with the single brake simultaneously.)

A. Well, my judgment is, if you guarantee the four men to work simultaneously, I've no objection, but should prefer the two; it might make little difference how the power is applied if it is applied simultaneously, the four men or the two.

18. Cross-q. When the single brake was used were the conductor and baggage-man in the habit of braking, in connection with the brakemen?

A. Not on the trains I was running.

19. Cross-q. On the trains which you were running on the New Haven road you have said that one brakeman was employed to three cars on an average, and that brakes were applied to but one truck of a car. How many brakes in that case would, as a general thing, be available on a train of six or seven cars toward stopping the train with the single brake?

A. There would be from three to four trucks available; if the 1727 ends of the cars having brakes on came together there would be four; but if not, only two.

20. Cross-q. At what speed, on an average, were trains run on the New Haven road at the time single brakes were used?

A. Way trains, twenty-three miles an hour; express trains, thirty-one and a half.

Redirect:

18. Q. How many brakemen would it require to apply the brakes to all the wheels of a train of six eight-wheeled cars with the single brake?

A. Seven.

19. Q. How many with the double acting brake?

A. Three.

20. Q. What effect does the single brake have upon the wheels of a car?

A. If well applied, it has a tendency to slip the wheels.

21. Q. What effect does this slipping have?

A. It makes flat places on the tread of the wheels.

22. Q. Will the brakes stop the trains as readily when the wheels slip on the track as when they do not?

A. They will not.

23. Q. Are the double brakes, or are they not, as liable to slide the wheels as the single brakes?

A. They are not.

24. Q. Then, if the single brakes are more liable to slide the wheels than the double brakes, is it your opinion that four men with the single brake would stop the train as regularly at the stations as two men would with the double brake?

A. I should prefer the two men with the double brake. There would be little difference, in my opinion, with regard to stopping the train. If I were master mechanic, and had regard to the wear of the wheels and machinery, I would prefer the two men to the four.

1728 25. Q. What, in your opinion, would be the damage to an engine in consequence of reversing with the single brake, as you have stated, in one year, or running the same time with the double brake?

(Objected to.)

A. It is difficult to get at the exact sum. One thousand dollars difference.

Recross:

21. Cross-q. In what way do you come to this conclusion that an engine is damaged a thousand dollars by reversing consequent upon the use of the single brake instead of the double brake?

A. It has the effect of loosening the bolts, of sucking ashes and cinders from the smoke arch—cutting your cylinders and valves, and causing your flues and furnace to leak.

22. Cross-q. Was the master mechanic of the New Haven road aware of this damage to engines, and yet continued running trains the cars of which had a brake on only one truck of a car?

A. I couldn't answer that question, for I know nothing about his business; but he must have been.

23. Cross-q. Would, in your judgment, there have been a remedy for this reversing the engines to stop at stations had the company applied the single brake to each truck of a car, and increased the number of brakemen to say two to three cars instead of one?

A. That probably would have remedied it to some extent.

24. Cross-q. Would it not almost, if not entirely, have obviated the necessity of reversing, providing each man did his duty as he now does with the double brake?

A. Well, it might to some extent—how much I don't know.

CYRUS W. BURTON.

1729 JAMES E. HUTTON, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. James E. Hutton; fifty years of age; residence, Jersey City; occupation, locomotive engineer.

2. Q. About how many years have you been running as locomotive engineer?

A. Well, about thirty years.

3. Q. Upon what railroads?

A. The New Jersey Railroad, the Erie Railroad, the Staten Island, the Harlem, the Charleston & Northeastern, the Charlotte & South Carolina, and the Texas & New Orleans.

4. Q. Are you at the present time employed upon any road as locomotive engineer; if so, what road?

A. Yes, sir; the New Jersey Railroad.

5. Q. About how long have you been locomotive engineer on that road altogether?

A. I have been there five different times—sixteen or eighteen years altogether. I have been there eight years this last time.

6. Q. At any time while you have been engaged as locomotive engineer, were single-acting brakes used on the cars in the trains which you run?

A. Yes, sir.

7. Q. What kind of trains were these?

A. Passenger trains and freight trains—both kinds.

8. Q. With these passenger trains using the single brake, did you as engineer have to do anything to aid in stopping the trains at stations; if so, what did you have to do?

A. I had to reverse my engine to stop them sometimes; sometimes I didn't.

9. Q. About how much of the time did you as engineer have to reverse you' engine to aid in stopping the trains with the single brake?

A. Full half the time.

1730 10. Q. At any time while you have run as engineer has there been any other kind of brake than the single brake used on the cars in your trains; if so, what kind of brake?

A. There has—the double brake.

11. Q. What kind of brake is used on the cars run by you in the trains on the New Jersey road at the present time?

A. The double brake.

12. Q. What kind of double brake?

A. A double lever brake—I believe the name is the Tanner.

13. Q. In stopping trains with the Tanner brake, do you have to reverse your engine; if so, about how much of the time?

A. Well, it is very seldom we do it now, very seldom we have to reverse the engine.

14 Q. What is the effect upon the engine of reversing it under headway?

A. It strains the engine, and affects it in a number of different ways.

15. Q. State whether or not an engine would run any longer without requiring to be sent into the shop for repairs when the Tanner double brake is used on the trains, than when the single brake is used; if so, how much longer, to the best of your opinion?

A. It would go to the shop quicker on the single brake—when we reversed; I think the engine would run as long again—double the length of time—when run as it is now with the double brake as compared with the way it was when the single brake was used.

16. Q. When the single brake was used on the trains you run, did you notice the effect of the brake on the car wheels?

A. I noticed them having flat places in them very often.

17. Q. Was there any improvement in this respect after the Tanner brake was introduced; if so, what was the improvement?

1731 A. I think there was. There were not so many flat wheels—very seldom I ever heard of one.

18. Q. How much, if any, longer do the car-wheels last with the Tanner double brake than they used to last, according to your observation, with the single brake?

A. I think they last as long again.

Cross-examined by M'r Whipple:

1. Cross-q. How many brakemen were employed on the trains run by you when the single brake was used?

A. Sometimes one, sometimes two—according to the number of cars we had.

2. Cross-q. How many brakemen on an average?

A. I never knew more than two on one train when we run with the single brake.

3. Cross-q. How many on an average were employed when the double brake was adopted?

A. They have about two to a train; sometimes they have more.

4. Cross-q. Could you not have avoided reversing the engine—stopping at stations—when you used the single brake by shutting off steam further from the station than is customary when you have the double brake?

A. Yes. I suppose you might have shut off steam so far off as to let the train run in without any brakes at all. But if you want to make any kind of time you have got to take all the chances to make the time.

5. Cross-q. If you were obliged to reverse the engine half of the time why not all the time?

A. Sometimes they hold better than they do at others—the brakes.

6. Cross-q. On the same grade and the same condition of track, would not the brakes hold, as a general rule, as well at one time and place as another?

1732 A. If they were in proper condition and applied in the same way, I suppose they would.

7. Cross-q. Were you to disconnect the brakes that are now used, running them as single brakes, would you have to reverse the engine in order to enable you to stop at stations, if the brakes were well kept up?

A. I think you would.

8. Cross-q. Is there any rule on the New Jersey road against the reversing of the engine?

A. Not that I know of.

9. Cross-q. Is there any rule forbidding brakemen to slide the wheels?

A. I don't know that there is; I don't know what orders the brakemen have.

Redirect:

19. Q. About how many cars, on the average, did there use to be on the trains on the roads where you ran in the days when the single brake was used?

A. I never ran on any road where the single brake was used except the New Jersey road and the Harlem road. On the Harlem road they used to run one to two cars in a train, and they had one brakeman. On the New Jersey road they used to have about one brakeman to three cars; the Newark train had about three cars and had one brakeman; the Philadelphia train had about five or six cars and two brakemen.

20. Q. How many cars do the passenger trains of the New Jersey Railroad average at the present time?

A. The principal trains run through; they have from eight to twelve cars; I had twelve cars in my train coming in this morning.

21. Q. Which were the heaviest—the cars in the days when they used the single brake, or the cars at the present day?

A. Oh! the cars at the present time.

22. Q. How much heavier are they at the present time, to the best of your opinion?

1733 A. Well, I should judge they are double the weight, if not more.

23. Q. With those trains, in the days when they used single brakes, did one brakeman apply more than one brake? If so, please tell how he did it.

A. One brake was about all they applied—when they had only one brakeman to a train.

24. Q. With cars of the weight which you say they have at the present time, would two brakemen to a train averaging five or six cars be sufficient to stop the train if the single brake was used?

A. Not at the speed we run now.

25. Q. Would it, in your judgment, be safe to run railroad trains, at the present day, if the double brakes were disconnected, and used only as single brakes?

A. I think not.

JAMES E. HUTTON.

1734 United States circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO & NORTHWESTERN RAILROAD Company. } In chancery.

Testimony taken on final accounting in the case before H. W. Bishop, esq., master in chancery, at Philadelphia, this seventh day of October, 1871.

JOHN P. RAY, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. John P. Ray; age, thirty-six; residence, Philadelphia; occupation, car-builder.

2. Q. By what railroad company are you at present employed, and how long have you been employed by it?

A. The Philadelphia & Westchester Railroad Company; I have been employed by that company two years.

3. Q. Did you have anything to do with any railroad before you

1735 were employed by that company; if so, what railroad, and in what capacity were you connected with it?

A. Yes, sir; the Camden and Atlantic, the Raritan and Delaware Bay, the North Pennsylvania, and the Philadelphia, Germantown & Norristown. I was foreman of the repair-shop of the Camden & Atlantic. I was on that road about three years. I was master of car-repairs on the Raritan & Delaware Bay for about two years. I was journeyman in the repair-shop of the North Pennsylvania for about six months. I was journeyman in the repair-shop of the Philadelphia, Germantown & Norristown for about eighteen months.

4. Q. About what years were you on the Raritan & Delaware Bay road?

A. I was there in 1864 and 1865.

5. Q. On said Raritan & Delaware Bay road, did you have anything to do with any other department than the repair-shop?

A. I had charge of all the departments of wood work on the road.

6. Q. About what year was it that you commenced being employed on railroads?

A. 1855.

7. Q. What railroad did you go on to at that time?

A. The Camden & Atlantic.

8. Q. Please state whether your various employments upon railroads have enabled you to become familiar with the operation and effects of the brakes used upon railroad cars.

A. Yes, sir.

9. Q. Will you please state what kinds of car-brakes you have seen in practical use.

A. In the first place, the single brake on a single truck; then comes the single-lever brake, double connected; then the Hodge; that is all.

10. Q. Have your various employments upon railroads led you to
observe the effects upon the car-wheels by the application of the
1736 brakes to them; and, if yea, please state what kind of brakes it
is the effects of which you have noticed.

A. Yes, sir; the effects of the single-acting brakes to slide the wheels, and of course "flatting" them. No effects ordinarily of any other kind of brake such as that.

11. Q. Which kind of brake wears or "flats" the wheels the least, the single-acting brake or the double acting?

A. The double acting.

12. Q. Will you please state from your railroad experience about how much longer, in your judgment, the car-wheels will last without "flatting" when the double-acting single-lever brake you have spoken of is used, than they will under the same cars and under the same circumstances, if the single brake is used?

A. About, I should say, three to one in favor of the double-acting brake. The single brake would wear out three sets to one with the double-acting. I have known with the single-acting brake the wheels to wear out in two hundred miles—two hundred consecutive miles.

13. Q. Take railroad passenger-trains as they are run at the present day, and state whether, in your judgment, they could be run with safety with only the single-acting brake?

A. No, sir.

Cross-examined by M'r Whipple:

1. Cross q. In what year, and on what road, did your experience with brakes first commence?

A. In 1856, on the Camden and Atlantic.

2. Cross-q. What brakes were then in use on the passenger-cars of that road?

A. They were then using both the single-acting and the double-acting.

3. Cross-q. What double-acting brake?

A. The single lever.

1737 4. Cross-q. What brakes were then used on freight cars?

A. Single acting.

5. Cross-q. About how long, according to your best judgment, do wheels last on freight-cars, when used under the single brake?

A. That would be a hard matter to answer, on account of the mileage.

6. Cross-q. How much longer will wheels last under freight-cars without brakes than with brakes—that is, single brakes on one end and no brake on the other truck?

A. I suppose three times as long. On a freight-car the brakes are not applied to every wheel in stopping a train. There seems to be a discrepancy in the two statements in regard to the wear of wheels on passenger and freight-cars, but in giving my testimony I take into consideration the fact that the brakes are not so long applied, nor so generally, in a freight-train as in a passenger-train.

7. Cross-q. Is it not usual to begin the application of brakes on a freight-train much further from the station where the train is to stop than in a passenger-train?

A. Not on the average.

8. Cross-q. On what roads, and at what time, did your experience with regard to the use of brakes enable you to come to the opinion that you have given with regard to the comparative wear of wheels under the single and double brake?

A. On the Raritan and Delaware Bay road, in 1864 and 1865.

9. Cross-q. Was that company at that time using single brakes on their passenger-cars?

A. Yes, sir.

10. Cross-q. To what extent?

A. On about one-half their cars.

11. Cross-q. What brakes were they using on the other half?

1738 A. The single-lever double-connected brake and the Hodge.

12. Cross-q. Did you keep an accurate account of the number of miles run by cars having the single brake, and also the double brake?

A. No, sir.

13. Cross-q. Did you keep an account as to the wear of wheels used under the single brake and the double brake, so as to enable you to come at a correct opinion as to the comparative wear of wheels under the two brakes?

A. Yes, sir.

14. Cross-q. In what way was that account kept?

A. It was kept only in my memory. When I spoke of not keeping accurate account, I mean book-account.

15. Cross-q. You say, I have known with the single brake wheels to wear out running two hundred miles. May not this have been the case without supposing they were spoiled by the brakes, and may it not have been accounted for by some defect in the "chill" of the wheels?

A. I could account for it only on account of the sliding of the wheels.

16. Cross q. Do not wheels give out in running very short distance sometimes, that have not been under brakes at all?

A. Very seldom, indeed, in my observation.

17. Cross-q. Did you ever know wheels to be slid when used under the double brake?

A. Yes, sir.

18. Cross-q. Is not the effect the same when slid under the double brake as when slid under the single brake?

A. Yes, sir.

19. Cross-q. Is there any way known to you whereby you can diminish the leverage on a single brake so as to, in a measure, prevent the sliding of the wheels?

1739 A. No, sir; and permit the brakemen to have control of the train.

20. Cross-q. Is it necessary that the brakeman should slide the wheels in order to control the train with a single brake?

A. No, sir. The reason they are slid by the brakeman is because they generally apply all their physical strength. I am now speaking of the average brakeman.

21. Cross q. Could you not diminish the size of the windlass-wheel by which the brakeman applied the power to the brakes so that he could not, even if he laid out all his strength, put any more power on one truck with the single brake than he could on each of the two trucks with the double brake having the ordinary sized windlass wheel?

A. Yes, sir; you could put any amount of power you want to on a wheel, whether effectually or not.

22. Cross-q. Are double brakes of any kind used on the freight-cars of any road or roads with which you have been connected?

A. No, sir.

23. Cross q. Do you deem it important that freight cars should have double brakes on them?

A. Yes, sir.

24. Cross-q. How do you account, then, for the companies which you have served so regardless of their own interests in not applying double brakes to freight-cars, if the saving is so great on wheels as you have testified in your direct examination?

A. I judge that is owing to blindness of the companies.

25. Cross-q. How many brakemen did they employ on a train when they used the single brake?

A. There is a difference in roads. The average would be about one man to two cars.

26. Cross q. What was the average where the double brake was used?

A. They would use about one-third less brakemen.

1740 27. Cross-q. In the running of trains of from three to five cars do they use more than two brakemen in either case?

A. I have known them to use three brakemen, the baggage-master being counted, and the conductor, too, sometimes; that would make four brakemen with the single brake—two brakemen on the pay-roll. With the single brake the baggage-master and conductor would brake, whereas with the double brake they wouldn't. Generally it requires all the available force with the single brake. I am speaking now ordinarily.

28. Cross q. In the use of the single brake was it or not customary for the engineer to reverse his engine in order to stop at the proper place at a station?

A. I have never known such to be the case unless to prevent accident.

29. Cross-q. Has it come within your observation in the use of the single brake, that there was any difference in the wear of the journal brasses compared with the wear of the brasses when used under the double brake?

A. Yes, sir.

30. Cross-q. What knowledge have you on that point?

A. There is more wear in the use of the single brake, because there is generally more power applied, and the wear is on the side of the brasses. With regard to the economy of the brasses, I couldn't say it was of so great moment. There will be some wear, but I never looked on that as of any great account.

Redirect:

14. Q. Do you know what kind of brake is in use on the freight-cars of the Pennsylvania Central Railroad?

A. No, sir.

JOHN P. RAY.

1741 H. B. MILLIKEN, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. H. B. Milliken; age, forty-eight; residence, New York City; locomotive engineer by occupation.

2. Q. How long have you been an engineer, and where have you been employed as such?

A. About twenty-eight years; on the Boston & Fitchburgh, the Vermont and Massachusetts, the New Haven Railroad, and the Hudson River road, where I am now employed.

3. Q. Please state, if you know, what kind of brakes were used on the passenger trains of the different roads where you have been employed?

A. On all the roads I was employed on till I came on the Hudson River, they were using then what they called the single-acting brake, and till some time after I came on the Hudson River they were using the single brake. I came to the Hudson River road the first of Jan-on uary, 1852.

4. Q. Was there any change made in the brakes on the passenger-cars of the Hudson River road after you came there; if so, what change?

A. There was—some time in the same year, along towards fall—putting a double-acting brake.

5. Q. About how long before they got the double brake on all their passenger-cars, as near as you can remember?

A. I think they didn't get the double brakes on them all till the later part of 1853.

6. Q. While you were running on the Fitchburgh road and the Vermont and Massachusetts road, what, if anything, did you do in stopping the trains at stations?

A. What they didn't stop with the brakes I stopped with the locomotive.

7. Q. How did you stop with the locomotive?

A. By reversing my engine.

1742 8. Q. About how often did you reverse your engine at stations on an average?

A. Well, it became a general practice to reverse the engines at stations. Two-thirds of the stations we would have to reverse.

9. Q. How was it when you went on the New Haven road as to reversing at stations?

A. Well, it was about the same there. I didn't run passenger-trains much there. I ran freight most of the time there; was sometimes taken off and run on passenger trains.

10. Q. How was it with regard to reversing your engine the first year you were on the Hudson River road?

A. At first, with the single brake, we had to reverse very often, about the same as on the other roads.

11. Q. After the double-acting brake went into use on the Hudson River road, did you have to reverse your engine to aid in stopping the trains; and if so, about how often?

A. It was so seldom that we had to do it that it would be impossible to make any estimate of it. We never hardly had to do it unless stopping at a water station when we were going very slow, and wanted to make an almost instantaneous stop, or we sometimes reversed just to take up the slack of the trains at the water stations; as to stopping at the stations, we very seldom had to do it. When the brakemen were well posted we never had to do it even to stop at the water stations.

12. Q. About how many years in all were you engaged in running on the Fitchburgh, the Vermont and Massachusetts, and the New Haven roads, before you came on the Hudson River?

A. Between five and six years.

13. Q. About how much time on each one of them, as near as you recollect?

A. On the Fitchburgh about four years, the Vermont and Massachusetts about seven months, the New Haven about the same.

1743 14. Q. How many years in all have you been engaged in running as locomotive engineer on the Hudson River road?

A. Twenty years next January.

15. Q. Please state what effect it has upon an engine to reverse it under headway?

A. It has a very injurious effect in sucking ashes and cinders down into the valves and cylinders—cutting the valves and steam-chest. And I have seen the main rods and crank-pins taken right out of an engine, in reversing an engine—broken.

Cross-examined by M'r Whipple:

1. Cross-q. How many cars, as a general rule, made up a train on the Fitchburg road?

A. About five cars.

2. Cross-q. How many brakemen were employed on such trains?

A. Two brakemen and a baggageman. In those times the baggageman most always broke, and the conductor also broke in those times. We also used to brake on the tender; we don't ever brake on the tender now—to stop at stations.

3. Cross-q. In the application of the single brake to the cars of the Fitchburgh road, was the brake applied to one truck of the cars or to both trucks?

A. They had a single brake on each end.

4. Cross-q. Could not two brakeman, baggageman, and conductor control a train of four or five cars with the single brake—a fireman using the brake on the tender—do as good execution in stopping the trains at stations as two brakemen would with the double brake on the same number of cars?

A. No; I don't think they could.

5. Cross-q. Please give your reasons for this answer.

A. The conductor, or any one of them, might put the brake on 1744 hard enough to slip the wheels, while another one might not put it on hard enough to do the necessary execution; while one man governing the whole eight wheels—one man is considered to apply the brake to all the wheels of two cars—and the friction comes more regular on the wheels with the double-acting brake.

6. Cross-q. Could not the necessity of reversing the engine to stop the train at stations where the single brake was used be obviated by increasing the number of brakemen—giving one brakeman to each car?

A. It could be obviated, but the result wouldn't be the same. We would say, for instance, take a car that is loaded and an unloaded car, and put the two together, the brakeman applying the brake upon the unloaded car, and the unloaded car would be apt to slide the wheels on the car that was not loaded, for it would be natural for him to put the brake on with the same pressure as on the loaded car; and the wheels of an unloaded car will slip quicker than the wheels of a loaded car.

7. Cross-q. Is not the same remark true with regard to the double brake?

A. In putting the double brake on an unloaded car the pressure would be so uniform that you wouldn't be so liable to slip the wheels on the two trucks as he would on the one single one.

8. Cross-q. How does the weight of passenger cars compare—those used on the Fitchburg road, in 1850, and those used now on that and other roads?

A. The cars at the present time are nearly two-thirds heavier than they were at that time.

9. Cross-q. Would it not take nearly or quite as much power to brake one truck of a car at the present time with the single brake, as it did to brake both trucks of a car with the double brake in 1850, the leverage being the same in both cases?

A. To answer that, yes or no, wouldn't be proper. I consider the effect would be just the same on a heavy car, as regards the ap-
1745 plication of the two brakes; that is, the labor of applying them, as it would on a light one; but if the same power is applied to a light car as to a heavy one, the light car will stop first.

H. B. MILLIKEN.

SATURDAY, *Oct. 14th*, 1871.

LUKE F. TRONSON recalled on behalf of the complainant:

1. Q. You testified here, a few days ago, that your occupation was that of a machinist, and that you were in the employ of the Morris & Essex division of the Delaware & Lackawanna Railroad; please state in what department of said Morris & Essex division you are employed as a machinist.

A. In the locomotive department. I am master-mechanic of the Morris & Essex division of that road.

2. Q. How long have you been master-mechanic on that road?

A. Including the time both before and since the Morris & Essex has been a part of the Delaware & Lackawanna Railroad, I have been master-mechanic of that road since February, 1856. Before that time I was foreman in the machine-shop of that road from 1850 to 1855, when I was absent for a few months, after which time I returned and took entire charge of the locomotive department of the road.

3. Q. As master-mechanic in charge of said locomotive department, what duties do you have to perform?

A. Superintend all their shops, keep all their engines in repair—see that they are kept in repair.

1746 4. Q. State whether these duties necessarily make you familiar with the details of engine construction and repairs, and with the results of accidents or injuries which happen to locomotives in the ordinary operation of a railroad?

A. Yes, sir.

5. Q. State whether you know what would be the effect upon a locomotive engine of reversing it frequently under headway; and, if so, please state what such effect would be. Answer fully.

A. Yes, sir; I do know. The effect is very often disastrous. In the first place, when you reverse an engine you pump the air into the exhaust-pipe, and down through the steam-chest and cylinder; sometimes bursting a steam-chest, and sometimes bursting a steam-pipe or blowing out a cylinder-head; it also draws or sucks ashes and cinders down into the steam-chest and cylinder, and cuts them, and also cuts the steam slide-valve and its seat; also, in reversing, there is a sudden reaction all through the engine, which strains it and racks it in every part, often starting the flues leaking and thereby damaging the boiler for the purpose of making steam; you can't make steam with leaky flues very well; it also strains and tends to injure the whole engine. I have known an engine to start out of the shop perfectly tight, and to come in after one trip, when she had been suddenly reversed, leaking like a riddle—leaking so bad that she wasn't fit to go out again without repairs.

6. Q. Please state how often, if at all, the engines running on passenger trains, on said Morris and Essex division, are reversed under headway, nowadays.

A. Not very often. Never, without it is to save life or avoid accident.

7. Q. About how much longer, in your judgment, will an engine last, if it is not reversed under headway any oftener than engines are at the present day on said Morris and Essex Railroad, as compared with
1747 the length of time it will last if it were reversed under headway on passenger trains frequently—say half the time?

A. Full one-third longer, and I think more than that.

8. Q. About how much more, if any more, do you think it would cost for the yearly repairs and injury to engines running on passenger-trains and reversed under headway as often as, say, half the time as compared with the cost of yearly repairs of the same engines under the same circumstances, but running on trains using double brakes?

A. Taking into consideration the liability to blow out cylinder-heads and steam-chests, and the other injuries I mentioned, I think it would cost from seven hundred and fifty to fifteen hundred dollars more per year per engine.

9. Q. State whether, in your judgment as a practical railroad man, it would be safe to run railroad passenger-trains as they are run at the present day—using single-acting brakes instead of double-acting.

A. I do not think it would; or, if they ran them safely, they would have to run them a great deal slower than they do now.

LUKE F. TRONSON.

Adjourned to Oct. 25th, 1871.

WEDNESDAY, *Oct. 25th*, 1871.

PETER M. DE CAMP, being duly called and sworn on behalf of the complainant, testified as follows:

Q. What is your name, age, residence, and occupation?

A. Peter M. De Camp; age, fifty-three; residence, Elizabethport, New Jersey; occupation, locomotive engineer.

1748 2. Q. On what railroad or railroads have you been employed as engineer?

The New Jersey Central; and I was on the Long Island road about three months.

3. Q. Do you remember about what year it was that you went on to the New Jersey Central as engineer?

A. I commenced on the New Jersey Central before the track was laid—in 1838.

4. Q. Do you remember about how long you remained on the New Jersey Central as engineer?

A. I have been an engineer running on the road a little over twenty-five years.

5. Q. Are you running on any railroad as engineer at the present time?

A. No, sir.

6. Q. When you first commenced running on the New Jersey Central as engineer, after the track was laid, what kind of trains did you run on?

A. On passenger-trains.

7. Q. On these passenger-trains, when you first began to run on said road, what kind of brake was used?

A. They were using the single brake then.

8. Q. In running these trains which used the single brake, did you as engineer have to do anything to aid in stopping the trains at stations; if so, what did you do?

A. Yes, sir; I had to reverse my engine. That was a general rule—to reverse the engine. We made that our practice.

9. Q. Was there at any time while you were running on said road as locomotive-engineer any change made in the brakes used on the passenger-trains; if so, what kind of brakes did they change to?

A. There was; they changed to the double brake.

10. Q. After the double brake was put on, how much of the time, if at all, did you have to reverse your engine in order to stop at stations?

1749 A. It was very seldom, unless it was from the carelessness of the brakeman not doing his duty.

11. Q. You have said you ran as locomotive-engineer on the Long Island Railroad about three months; what kind of trains did you run on this road?

A. On passenger-trains.

12. Q. What kind of brake was used on the cars in these trains at that time on the Long Island road?

A. They used single brakes at that time.

13. Q. When running these passenger-trains on the Long Island road, did you as engineer have to do anything to aid in stopping the trains at stations; if so, what did you do?

A. We used to reverse our engines very often.

14. Q. About how much of the time did you have to reverse your engine to stop at stations on said road?

A. Well, I should think it was all of two-thirds of the time, as near as I can recollect.

15. Q. Which will run the longest without having to be sent into the shop for repairs—an engine which is reversed under headway as often as you used to have to reverse engines when the single brake was used, or an engine which is reversed no oftener than is necessary when the double brake is used?

A. The one that is run with the double brake will wear the longest.

16. Q. About how much longer do you think the engine run with the double brake will last without being sent into the shop for repairs than the same engine would last run with the single brake?

A. Well, I should think there would be about one-third difference.

Cross-examined by M'r Whipple:

1. Cross-q. When they used the single brake on the New Jersey Central road, was it applied to both trucks of the car or to only one truck?

1750 A. There was one on each end—applied to each truck separately.

2. Cross-q. How many brakemen were employed on a train at the *the* time you were engineer—at the time they used single brakes?

A. It was a good deal owing to the number of cars. If we had two or three cars, we would have one brakeman besides the baggage-master; when we had four or five cars, we would have two brakemen besides the baggage-master.

3. Cross-q. Do you think, as a general rule, there would have been any necessity for reversing the engine in order to stop at stations had there been more brakemen employed on the trains—with the single brake?

A. There would, with the single brake.

4. Cross-q. Suppose there had been a brakeman to each car, on an average, do you think there would then have been any necessity for reversing the engine to stop at stations, with the single brake?

A. I think there would be a necessity for reversing the engine.

5. Cross-q. Were a brakeman employed at each single brake of the train, do you think there would still be a necessity for reversing the engine in order to stop at stations properly?

A. I think there would.

PETER M. DE CAMP.

Lewis Elder, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Lewis Elder; age, forty-three; residence, New York; occupation, locomotive engineer.

1751 2. Q. On what railroad or railroads have you been employed as engineer?

A. On the Hudson River, the New York & Harlem, the Philadelphia, Wilmington & Baltimore, and the New York & Erie.

3. Q. About what year did you commence running as locomotive engineer on the Hudson River road; about what year on the Harlem; about what year on the Erie; and about what year on the Philadelphia, Wilmington & Baltimore?

A. I commenced on the Hudson River road in 1851; on the Harlem, I think, the latter part of 1854, and returned to the Hudson River in 1857. I was on the Erie two years—1864 and 1865. I was on the Philadelphia, Wilmington & Baltimore only a short time. Left there to go to the Erie. I am running at the present time on the Harlem road.

4. Q. During the first part of the time you ran as engineer on the Hudson River road, what kind of trains did you run on?

A. I ran on passenger-trains in 1852.

5. Q. What kind of brakes were used on the cars in those passenger-trains at the time you ran them?

A. Single brakes at first.

6. Q. What kind of brakes afterwards?

A. Double.

7. Q. At the time you ran those trains with the single brake, did you, as engineer, have to do anything to aid in stopping the trains at stations; if so, what?

A. Yes; we used to have to reverse often—reverse the engine.

8. Q. About how much of the time did you have to reverse?

A. I should judge one-third, or more.

9. Q. After the double brake came to be used on said road, how much of the time, if at all, did you have to reverse in stopping at stations?

A. Scarcely any.

1752 Cross-examined by M'r Whipple:

1. Cross-q. Would there have been, in your judgment, a necessity for reversing the engine as a general thing to stop the train at stations when the single brake was used, had there been a brakeman employed, on an average, for every car on the train?

A. I think there would.

2. Cross-q. How many cars, on an average, should you judge there were run in a train after the double brake was introduced?

A. I could only say about the trains I run; there were different numbers, from six to nine.

3. Cross-q. How many brakemen were there employed on such trains when the double brake was introduced?

A. Three, I believe, to the best of my recollection.

4. Cross-q. How many brakemen were employed on the same trains when the single brake was used?

A. I think the same, and the baggage-master in addition.

5. Cross-q. Suppose a brakeman had been employed to operate each single brake in a train—there being a brake on each end of each car—do you think, in such case, there would have been a necessity for reversing the engine to stop at the proper place at stations?

A. That would have been an equivalent to the double brake if the brakemen applied the brakes with judgment so as not to slide the wheels.

6. Cross-q. Do brakemen ever slide the wheels with the double brake?

A. Seldom; they can slide them, but it is their orders not to.

7. Cross-q. Do brakemen always obey orders in this respect?

A. Not always.

1753 Redirect:

10. Q. Do the brakemen need to slide the wheels with the double brake as a general thing in order to stop trains?

A. As a general thing they do not.

11. Q. Which is more likely to slide the wheels under ordinary circumstances, the single brake or the double brake?

A. The single.

12. Q. Taking brakemen as they are ordinarily found on railroads, and suppose two of such brakemen to be stationed on a car—one at each end—would or not those two brakemen be likely, under ordinary circumstances, to slide more or less of the wheels if the single brake was used?

A. Yes, sir.

13. Q. Taking one of these brakemen and the same car, would he or not be likely, under ordinary circumstances, to slide the wheels if the double brake was used on that car?

A. No. In fact, I have seen two brakemen on a double brake and then not slide the wheels. It depends, you know, a great deal whether the car is loaded or empty—an empty car will slide a good deal easier than a loaded car. This applies the same to single brakes as double brakes.

14. Q. Now, suppose a brakeman had been employed to operate each single brake—one on each end of each car—in the single-brake trains you ran on the Hudson River road in 1852, and they had slid the wheels as you have just stated two brakemen to a single-brake car, under ordinary circumstances, would do—would it or not have been necessary to reverse the engine to aid in stopping the trains at stations?

A. It would on that road and at their rate of speed.

1754 Recross:

8. Cross-q. You mean by this, do you, that with a train of five cars and ten brakemen—one to each single brake—there would be a necessity in view of the speed run on the Hudson River road, to reverse the engine to stop properly at stations?

A. There would, oftentimes, at the speed they run at that time.

LEWIS ELDER.

JAMES B. WILSON, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. James B. Wilson; age, forty-one; residence, Newark, New Jersey; occupation, locomotive engineer for twenty-one years.

2. Q. On what railroad or railroads have you been employed as engineer?

A. On the Baltimore and Ohio Railroad, the Scranton Railroad, the New York and Erie road, the Buffalo and Rochester road, the Indianapolis and Terre Haute road. I am now on the New Jersey Central, running from Jersey City to Newark.

3. Q. In about what year did you commence to run as engineer on the Baltimore and Ohio road?

A. Nineteen years ago—somewhere about there, less or more. I ran there three years.

4. Q. When you ran there, what kind of trains did you run on?

A. Passenger-trains, freight-trains, and coal-trains.

5. Q. On the passenger-trains you ran there what kind of brake was used?

A. The single brake.

1755 6. Q. Did you as engineer have to do anything to aid in stopping these single-brake passenger-trains at stations; if so, what?

A. I had; reverse my engine.

7. Q. About how much of the time did you have to reverse your engine on these trains?

A. Every time we stopped; it would depend on what speed we were going.

8. Q. Taking the ordinary speed at which those trains were run, how much of the time did you have to reverse to aid in stopping the trains at stations?

A. Every time.

9. Q. Did you ever, on any of the roads you have been employed on as engineer, run on the passenger trains which used the double brake?

A. I have. I run with the double brake now.

10. Q. In running such double-brake trains, how much of the time, if at all, do you have to reverse your engine to aid in stopping trains at stations?

A. Not at all.

11. Q. What is the effect upon an engine of reversing on passenger trains to stop at stations?

A. A great deal of damage to the machinery.

12. Q. Please state some of the ways in which it damages an engine.

A. It damages the boiler; it strains it. It damages the packing and the valves. It damages the driving-wheel boxes; it is a great strain on them every time you reverse. In fact, it damages all the working parts of the engine.

13. Q. In your judgment, how much more would it cost in a year to repair an engine which was reversed under headway as often as would

be necessary on passenger trains using the single brake than it would to repair the same engine on the same trains if the double brake was used?

A. From one to two thousand dollars.

(Cross-examination waived.)

JAMES B. WILSON.

1756 HUMPHREY JACKMAN, recalled on behalf of the complainant.

1. Q. Please state what have been your opportunities for becoming practically familiar with the construction and operation of locomotive engines, both while you were on the Concord & Nashua Railroad, and since you have been on the New Jersey Central. Answer fully.

A. My opportunities have been from repairing and keeping engines in running order on each of those railroads. It has always been my business till the last year.

2. Q. For about how many years would this make it that it has been your business?

A. About thirty years; twenty-eight to thirty.

3. Q. While you were on the Concord & Nashua road, did the engineers running the passenger trains which used the single brake, have to do anything to aid in stopping the trains at stations; if so, what?

A. They, as a general thing, reversed their engines.

4. Q. How did you become acquainted with the fact that they had to reverse their engines?

A. By being out considerable on the road, and by remarks made, and by repairs on the locomotives caused by reversing.

5. Q. Can a man, accustomed practically like yourself to the repairing and keeping in running order of locomotive engines on railroads, tell from the condition of an engine coming into the shop for repairs whether it has been reversed under headway frequently?

A. I should think he could.

6. Q. Will you please state what is the effect upon an engine of reversing it under headway frequently?

A. It would be to loosen the braces from the boiler and frame; cause the cylinders to loosen from the fire-box and frame. It is liable to draw in cinders and ashes into the steam chest, causing the valve to
1757 destroy the valve seat and the piston to wear out the cylinder
faster; liable to blow off the steam chest and to blow out the cylinder heads; also liable to break the piston from the piston rod, and in that case the cylinders are liable to be broken to pieces and destroyed; and it is liable, and frequently causes, the flues to leak; it also causes what we call a "pound," a lateral motion in the driving boxes, the boxes of the driving wheels, and an impairing of all the running gear, from the sudden motion.

7. Q. In passenger trains using the double brake, how much of the time, if at all, do the engineers have to reverse their engines to stop at stations?

A. So far as my knowledge goes, they do not reverse their engines to stop except in cases of danger.

8. Q. About how much more, if any more, do you think it would cost for the yearly repairs and injury to engines running on single-brake passenger trains and reversed under headway as often as you say they had to reverse on the Concord and Nashua road, or as, under ordinary circumstances, engineers of passenger trains would have to reverse to

stop at stations, as compared with the cost of yearly repairs of the same engines under the same circumstances, but running on trains using double brakes?

A. Well, I should think somewhere from eight hundred to fifteen hundred dollars a year, or for thirty thousand miles run.

9. Q. About what is the average yearly mileage of locomotive engines, under ordinary circumstances, on passenger trains?

A. Twenty-five to thirty thousand miles.

10. Q. When you kept the mileage accounts of engines on the New Jersey Central Railroad, as you testified at page 74 of this record, how long did it take the engines to run forty thousand miles, on the average?

A. A year to a year and a half. They would hardly ever go over thirty thousand miles a year.

(Cross examination waived.)

HUMPHREY JACKMAN.

1758 Edwin Jones, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Edwin Jones; age, forty-three; residence, New York; occupation, locomotive engineer,

2. Q. On what railroad or railroads have you been employed as locomotive engineer?

A. Only the New York and New Haven road. I have been locomotive engineer for nineteen years, running on that road.

3. Previous to your becoming locomotive engineer on said road, did you act as fireman on any railroad or railroads; if so, what road or roads?

A. The New Haven road, and on the Hartford and Springfield, and also for a while on the Western Railroad, now the Boston & Albany.

4. Q. For about how long were you fireman on the Hartford and Springfield road, and how long were you fireman on the New Haven road before you acted as engineer?

A. I was fireman on the Hartford and Springfield about fourteen months, and a year and a half on the New Haven road before I became engineer.

5. Q. Upon what kind of trains were you fireman on the Hartford and Springfield road and on the New Haven road?

A. Passenger trains on both roads.

6. Q. What kind of trains are you now running on the New Haven road?

A. Passenger trains.

7. Q. About what year did you first commence to run as engineer on passenger trains on the New Haven road?

A. It was in the summer of 1852.

8. Q. When you ran as fireman on the passenger trains on the Hartford and Springfield road, and on the New Haven road, what kind of brakes was used on the cars in said trains?

A. The single brake.

1759 9. Q. When you first commenced to run as engineer on the New Haven road on passenger trains, what kind of brakes was used on the cars in said trains?

A. The single brake.

10. Q. At the time these single brake passenger trains were run on said Hartford and Springfield road, and said New Haven road, did the

engineer have to do anything to aid in stopping the trains at stations; if so, what did he do?

A. He oftentimes had to reverse his engine to stop the trains—to prevent them running by the stations. This was the general practice; it used to be considered necessary for the engine to help stop the trains at stations.

11. Q. After you became engineer on the New Haven road, was there any change made in the brakes on the cars in the passenger trains; if so, what brake did they change to?

A. There was; they put on what we called the double connected brake—it broke on both trucks at the same time.

12. Q. What form of double connected brake was it which was put upon said cars at the time of this change?

A. The double brake that has a cross lever under the centre of the body of the car.

13. Q. After this centre lever double brake was introduced on the cars of this road, how much of the time, if at all, did the engines running on passenger trains there have to be reversed to aid in stopping at stations?

A. We didn't do it at all—except in cases of emergency.

14. Q. Please state what is the effect on an engine of reversing it under headway.

A. In reversing an engine you are liable to break a connection rod or crank pin, or knock a cylinder head out—you are liable to break the
cylinder when you knock the head out. I have broken a crank
1760 pin and knocked my cylinder head out reversing an engine. I
have known the works on one side of an engine to be stripped off
from reversing. When you reverse, the ashes and cinders are sucked into the valves and cylinders; it also strains the flues, causing the boilers to leak, and is liable to break the packing of the piston in the cylinder. It strains the engine in every part.

15. Q. About how much more do you think it would cost for the yearly repairs of a passenger engine which was reversed under headway as often as would be necessary, under ordinary circumstances, in trains using the single brake, compared with the yearly repairs of the same engine under the same circumstances, if the double brake was used on said trains?

A. From a thousand to fifteen hundred dollars per year—as near as I could judge.

16. Q. On these single brake passenger cars on the New Haven road of which you have spoken, how many of these single acting brakes were there on a car?

A. Some of the cars had a single brake on only one end, and I think some of them had a single brake on each end.

EDWIN JONES.

Adjourned to Thursday, Oct. 26th, at 11 a. m.

1761 THURSDAY, *Oct. 26th*, 1871.

WELLINGTON RIDDELL, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Wellington Riddell; age, forty-seven; Jersey City is my place of residence; occupation, locomotive engineer.

2. Q. On what railroad or railroads have you been employed as engineer?

A. The Long Island, the Hudson River, and the New York and Erie.

3. Q. About what year did you first commence to be employed on the Long Island Railroad?

A. 1848.

4. Q. When you first commenced on that road, in what capacity were you employed?

A. I was fireman on locomotives.

5. Q. Running on what kind of trains?

A. Mail and passenger.

6. Q. Did you run as locomotive engineer on the Long Island road at any time; and, if so, about what time did you commence to be engineer?

A. Yes, sir; I was fireman about three years, and along in the latter part of 1851 I commenced to run as engineer.

7. Q. While you were locomotive fireman on said road, what kind of brakes were used on the cars running in passenger trains there?

A. Single four wheel brake; what we call a single truck brake—braking on one truck.

8. Q. Were these single brakes used on the cars running in the passenger trains on that road after you commenced to run as locomotive engineer there?

A. Yes, sir; I don't know that they all were—after I became engineer—but the single brakes were in general use on the road when I commenced running as engineer.

1762 9. Q. When these single brakes were used on the cars running in the passenger trains on said Long Island road, did the engineer have to do anything to aid in stopping trains at stations; if so, what?

A. Invariably he had to reverse his engine. As a general thing, we used to consider reversing the engine the best brake on the train; the others were not sufficient to hold.

10. Q. At any time while you were on the Long Island road as locomotive engineer, was any change made in the brakes on the cars running in the passenger trains; if so, what kind of brakes did they change to?

A. Yes, sir; they changed to the double brake—by which they could brake at either end of the car.

11. Q. State how much of the time, if at all, you as engineer had to reverse your engine to aid in stopping the passenger trains at stations, after the double brake was introduced on that road.

A. It was rarely it ever happened after we had the double brake.

12. Q. In your judgment how much more, if any more, would the injury and repairs caused to a locomotive engine yearly, if reversed under headway as often as would be necessary if single brakes were used on passenger trains, cost as compared with the yearly repairs of the same engine under the same circumstances, if reversed no more often than is necessary when the double brake is used on the cars?

A. I should think as an average thing the difference would be from seven hundred to fifteen hundred dollars yearly; and two-thirds more labor with the single brake for the engineer and fireman.

(Cross-examination waived.)

WELLINGTON RIDDELL.

Adjourned to Friday, Oct. 27th, 1871.

1763 FRIDAY, *Oct.* 27*th*, 1871.

JOSHUA P. MARTIN, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Joshua P. Martin; age, fifty-four years; Jersey City is my place of residence; and my occupation is that of locomotive engineer.

2. Q. Upon what railroad, and in about what year, did you first commence railroading?

A. I commenced in about 1834, on the Philadelphia and Columbia Railroad, owned at that day by the State of Pennsylvania.

3. Q. In what capacity were you employed on that road when you first went there?

A. First as fireman.

4. Q. Fireman on what kind of trains?

A. On freight and passenger.

5. Q. After you were fireman on said road, in what other capacity, if any, were you employed there?

A. I was locomotive engineer.

6. Q. On what kind of trains?

A. Freight first; afterwards passenger.

7. Q. Did you go upon any other railroad after leaving said Philadelphia and Columbia road? If so, what road?

A. I did, sir. I went from there upon what was called at that day the Elizabeth and Somerville Railroad, now a part of the Central Railroad of New Jersey.

8. Q. In about what year did you leave the Philadelphia and Columbia road to go upon the Elizabeth and Somerville Railroad?

A. In about 1837; along there.

9. Q. When you went on to the Elizabeth and Somerville Railroad, in what capacity were you employed there?

A. I went there as locomotive engineer, machinist, and master-mechanic.

1764 10. Q. As locomotive engineer there, what kind of trains did you run on?

A. Freight and passenger.

11. Q. Did you go from said Elizabeth and Somerville road to any other road? If so, to what road?

A. I went from there to the New York and Erie Railroad, twenty-five years ago the day before yesterday.

12. Q. When you first went on the Erie road, in what capacity were you employed?

A. As locomotive engineer, conductor, master-mechanic, general locomotive dispatcher, and afterwards back again to engineer.

13. Q. Where are you employed as locomotive engineer at the present time?

A. On the New York and Erie road, or the Erie Railway, as it is now called.

14. Q. When you were fireman on the Philadelphia and Columbia road, and engineer on the Elizabeth and Somerville road, what kind of brake was used on the cars running in the passenger trains on said roads?

A. The first brake was what we would now call only half a brake—bore on only two wheels, with a lever to press against.

15. Q. Was there more than one of these half-brakes on a car? If so, how many?

A. Yes; as a general thing, on the eight-wheeled cars, there was one on each end.

16. Q. You say this was the first brake used on the passenger cars on these roads. What was the next brake used on said cars on said roads?

A. The next brake was a brake that broke on the four wheels of one truck.

17. Q. When you were first employed as locomotive engineer on the

Erie road, what kind of brake was used on the cars running in the passenger trains on that road?

A. The same; the one used on four wheels of one truck.

1765 18. Q. During the time these brakes acting on only one truck were used on the roads you have mentioned, did you as engineer have to do anything in running trains there to aid in stopping such trains at stations? If so, what did you do?

A. Certainly; I had to reverse my engine generally.

19. Q. You say "generally." About how much of the time, on the average, did you have to so reverse your engine to stop at stations?

A. Well, it would average five times out of six.

20. Q. Did the passenger coaches on any of the roads you have mentioned have more than one on a car of these brakes acting on one truck? If so, how many to a car?

A. They had only one to a car for a number of years. Afterwards they added a second brake to the other end of the car.

21. Q. After this second single brake was added to the other end of the car, about how much of the time, on an average, did you have to reverse your engine to aid in stopping at stations?

A. It didn't make a great deal of difference unless there was an extra man. If there was an extra man at the other brake it made some little difference. I don't think, on an average the year through, it made any difference about reversing the engine after the second single brake was added to the other end of the cars.

22. Q. After these single brakes acting on only one truck were used on the Erie road, either on one end or on both ends of the car, was there any other kind of brake used on the cars in the passenger trains? If so, what kind?

A. There was, some years afterwards, what we call the double brake.

23. Q. Please state, if you recollect, what kind of double brake was used on said Erie road among the first used there.

1766 A. The connection made was under the body of the car. The brakes were connected so that when you drew on one end it affected the brakes on both trucks.

24. Q. Do you recollect whether in any of these double brakes there was a cross-lever under the center of the body of the car?

A. I think there was. I am certain that was the first connection.

25. Q. After these double brakes having the cross-lever under the center of the car-body were introduced on the Erie road, did you still run passenger trains there as engineer? If so, about how much of the time did you, as engineer, have to reverse your engine to aid in stopping trains at stations?

A. I didn't run regularly after that; occasionally I did. I didn't reverse at all stopping at stations. Frequently I would have to blow "off brakes" to let the train run up to the station.

26. Q. Why was it necessary to blow "off brakes"?

A. For the brakemen to let off the brakes so that we would run up to the stations, and not have to let on steam to run up.

27. Q. What was the cause of the brakemen putting on the brakes so as to make this necessary?

A. Not being accustomed to the double brake, the effect of it being so sudden, they applied the brake at the same point that they did the single brake till after they became acquainted with it.

28. Q. Was there any necessity of blowing the double brakes off after the brakemen became familiar with them?

A. No; not after the brakemen became accustomed to the distance they could control the train in.

29. Q. After the brakemen became accustomed to the double brakes,
did you, when running as engineer, have to reverse your engine
1767 to aid in stopping the trains at stations? If so, about how much
of the time on an average?

A. It didn't average once in a hundred times.

30. Q. Is there any difference in the cost of yearly repairs of a locomotive engine reversed under headway as often as would be necessary in running passenger-trains having only single brakes on each end of the car, as compared with the yearly repairs of the same locomotive under the same circumstances when the double brake is used on the cars?

A. Yes, sir; there is a great deal of difference in the expense.

31. Q. For which engine would the repairs cost the most, and about how much the most would they be, in your judgment, per year?

A. The cost would be most for the engine with the single brake; I should average it at fifteen hundred dollars a year.

32. Q. On the roads on which you have been employed, did you have opportunities of observing whether the application of the single brakes wore the wheels? If so, what opportunities did you have?

A. Oh, yes, I had opportunities from observation and having charge of the wheel department.

33. Q. After the double brakes were introduced on the Erie road, as you have stated, did you have opportunities for observing how the wheels lasted then?

A. I had opportunities from observation where they were taking them off and putting them on.

34. Q. Which lasted the longest, the wheels with the single brake or the wheels with the double brake?

A. Those with the double brake.

35. Q. Taking a passenger-car under ordinary circumstances, would
there, in your judgment, be any more sets of wheels required for it in a
year if it had a single brake than if it had a double brake; and,
1768 if so, how many sets do you think would be needed for the single-brake car as compared with the double-brake car in a year?

A. I should think it would take about three sets for the single-brake car to one with the double—three to one.

36. Q. Will you please state some of the effects produced upon an engine by reversing it frequently under headway.

A. Well, blowing off cylinder-heads, breaking joints, starting flues to leaking, suction of air through the exhaust-pipe, carrying the sparks and sand into the steam-chest, causing the valves to cut very fast, and the seats of the valves; throwing the driving-wheels out of quarter, tearing the pins, breaking side-rods, breaking pedestals, and frequently the frame of the engine, throwing it off the track.

37. Q. Suppose the double brakes were taken off of passenger-cars at the present day, and single-acting brakes substituted for them at each end of the cars, could or not, in your judgment, such trains be run with safety?

A. No, sir, they could not be run with safety at the time-table speed they are run now.

38. Q. Will you please state what was the average weight of locomotive engines for passenger-trains just previous to the time the double brake was introduced into use as you have stated?

A. Well, from twenty to thirty tons.

39. Q. State what road these engines were run on.

A. The Erie Railway.

40. Q. What is the average weight of locomotive-engines run on that road now, on passenger-trains?

A. From thirty to forty tons.

Cross-examined by M'r Whipple:

1. Cross-q. In your answer to the 27th direct interrogatory, you say,
"Not being acquainted with the double brake—the effect of it
1769 being so sudden, they (the brakemen) applied the brake (that is,
the double) at the same point they did the single brake, till after
they became acquainted with it" (the double brake). Did the application of the single brake at "the point" assumed by the brakemen stop the train at the proper place at the station, generally?

A. It did not, without the assistance of the engine.

2. Cross-q. Please state whether the single brakes might not have been applied at a sufficient distance from the station to stop the trains without the aid of the engine, as a general thing.

A. They could, provided the time on the time-table would have admitted of the delay of the trains in making those stops, and made our time through on the road. I claim that we would have lost probably two hours in running four hundred miles.

3. Cross-q. How many cars, on an average, composed the trains on the Erie road when the single brake was in use?

A. We would average about five, I should judge.

4. Cross-q. How many persons were employed to operate the brakes on such trains of five cars?

A. A brakeman to a car.

5. Cross-q. Were the brakes of all the trucks, or nearly all, applied either by brakeman, baggage-man, or conductor?

A. As a general thing they were.

6. Cross-q. Am I understand that under these circumstances—that is to say, when all the brakes of a train of five cars were applied at the proper time, you were obliged, in addition to this force, to reverse your engines five cases out of six, in order to stop properly at stations on the Erie road?

A. Yes, sir; to make time.

7. Cross-q. When the double brake was applied to the same train of five cars, were there any more trucks brought under the brakes than when the single brake was used?

A. I think not.

1770 8. Cross-q. What difference, if any, does it make in stopping
a train whether the power is applied to two trucks at a time, or
to only one truck, providing it is applied properly to all the trucks.

A. It would make a difference of half a minute.

9. Cross-q. What is your reason for this statement, in view of the fact that the brake has been properly applied to all the trucks of the train in both cases?

A. When you have got a single brake, if the brakeman applies his whole strength to the brake, and locks the wheels so they will slide—and they do not hold so well when they slide as when they are rolling slowly—where the same brakeman with the double brake has not the power to lock both trucks; as the leverage for braking has not been changed, there isn't any more leverage for the double brake than for the single.

10. Cross-q. Suppose that you, as master mechanic, was called upon by a superior officer of your road to so reduce the leverage of a single

brake as to make it an efficient brake, so far as the application to one truck is concerned, could you do it, and prevent the sliding of wheels, as a general thing, on an ordinary dry track?

A. I wouldn't be willing to take an oath that I could do it and make an efficient brake.

11. Cross-q. Waiving the oath for the time being—what is your judgment in the matter, as a master mechanic—could you or not so graduate the power of the brakeman by diminishing the size of the windlass-wheel, or increasing the size of the mandrel on which the chain is wound, that an ordinary brakeman, under ordinary circumstances, would apply no more power to a truck when the single brake is applied than to the same truck, in the same car, having the double brake applied to both trucks?

A. Yes; it could be done.

12. Cross-q. What was the usual speed of the train at the time
1771 you reversed the engine to stop it at a station, and how far would
the train run, as a general thing, after reversing?

A. I should put it at eight miles an hour, and we would go, on an average, three hundred feet after reversing.

13. Cross-q. Were the driving wheels, while passing over this three hundred feet, revolving in an opposite direction—or sliding upon the rail—and this five times out of six, in your effort to stop at all stations over a given route?

A. Well, they would be revolving the same way the train is going, for a certain distance, then they'd slide, and then you could get them to revolve in the opposite direction.

14. Cross-q. How much of this three hundred feet would they revolve in the opposite direction?

A. Well, I would say as a general thing about fifteen to twenty feet.

15. Cross-q. And was this process repeated five times out of six from station to station, owing to the incapacity of the brakes and brakemen to stop the train at the proper place?

A. Yes, sir.

16. Cross-q. Was the master mechanic, or whoever had charge of repairs on engines on the Erie road, aware of this necessity of reversing the engine as often as you state, in order to make time?

A. Yes, sir.

17. Cross-q. Was there, in your judgment, no remedy for this reversing of engines except in the application to the cars of double brakes—that is to say, could not the leverage have been so graduated as to have still had efficient brakes so far as one truck is concerned, and the number of brakemen increased so that on an average there would have been a brakeman to each car—and so have obviated the necessity of reversing as a general rule?

A. I think not; unless you had had a wire strung through so that
every brakeman would have applied his brake at the same time.

1772 18. Cross-q. Is it necessary to have a wire strung through the
train in order that the brakeman of the train should apply the
double brake at the same time, in order to make it efficient to stop the
train without reversing the engine?

A. No, sir.

19. Cross-q. Cannot a brakeman apply the single brake in a less number of seconds than he can the double brake—there being less chain to wind up in the former case than in the latter?

A. There is not less chain to wind up.

A. The Erie Railway.

40. Q. What is the average weight of locomotive-engines run on that road now, on passenger-trains?

A. From thirty to forty tons.

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1. Cross-q. In your answer to the 27th direct interrogatory, you say, "Not being acquainted with the double brake—the effect of it 1769 being so sudden, they (the brakemen) applied the brake (that is, the double) at the same point they did the single brake, till after they became acquainted with it" (the double brake). Did the application of the single brake at "the point" assumed by the brakemen stop the train at the proper place at the station, generally?

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A. No, sir.

19. Cross-q. Cannot a brakeman apply the single brake in a less number of seconds than he can the double brake—there being less chain to wind up in the former case than in the latter?

A. There is not less chain to wind up.

20. Cross-q. Do you now refer to the double brake now in use on the Erie road, when you say there is not less chain?

A. I do.

21. Cross-q. What double brake is now in use on the passenger-cars of the Erie road, and how are the levers arranged for operating the brakes?

A. I couldn't tell you whose brake it is. I think there is a centre leverage under the body of the car. Then there is another brake that I call a connection under the centre of the car, with chains passing through rollers.

22. Cross-q. Assume that the brake now in use on the passenger-cars of the Erie road consists of four vertical levers attached to the brake-bars of the trucks, and connected with each other by rods and to the windlasses of the car—the windlass-chain at either end having to take the slack of all the levers before the brake can be operated effectually—would it not take longer to apply such a brake to both trucks of a car than it would to take up the slack of one lever applied to one truck—which constitutes the single brake?

A. A perfect brake hung properly has no more slack to it with four levers than with one lever.

23. Cross-q. What, in your judgment, do the six-wheel passenger-coaches of the Erie Railway weigh?

A. Fifty tons. I think that is low.

1773 24. Cross-q. What, in your judgment, did the passenger-coaches
on the Erie Railway weigh when you first came on to that road?

A. From fifteen to twenty tons.

25. Cross-q. Would it not require more power to slide the wheels of a single truck with a single brake on the present fifty-ton coaches than to slide all the wheels in the twenty-ton coaches with the double brake?

A. Yes.

26. Cross-q. Then were you as master mechanic called upon to disconnect the brakes of these fifty-ton coaches and use only the single brake, would you have any trouble is so graduating the power as not to slide the wheels, as a general rule, any more than the double brake would slide them under the twenty-ton coaches?

A. There would be some difficulty in graduating the single brake on those fifty-ton coaches. It could be done—anything can be done.

27. Cross-q. It appears by your evidence that there were times when you did not reverse your engine to stop the train at stations; why not? If reversed once, twice, or more, why not always and at every stop you wished to make at stations?

A. Now, I am running and I leave Port Jervis, and I make four stops before I strike Narrowsburg. Now, the grade and the line of the road and stations were on a level and long curves. At Narrowsburg, you run in on quite a steep grade—going west—and a very sharp curve, and that would assist the brakemen to stop the train—the steep grade and sharp curve. Brakemen have generally a point where they apply the brakes.

28. Cross-q. Did the brakemen have their point near all stations where they would apply the brakes in order to stop at the proper place at the
stations, whether the single or the double brake was in use?

1774 A. I think they had about the same point. The whistling post
is about five hundred yards from the stations, and they generally make that their point.

29. Cross-q. Was there no more time given to stop the train with single brakes on the Erie road than now that double brakes are used?

A. The same post is used in both cases.

30. Cross-q. Then it was owing to the shortness of distance, was it, that you were allowed to apply the single brake in approaching the stations that you were obliged to reverse the engine in order to make time?

A. Yes.

31. Cross-q. Had you been allowed a greater distance in which to apply the single brake, would it have obviated the necessity, as a general rule, of reversing the engine?

A. Yes; but we couldn't have made our time.

32. Cross-q. What was the average time of the trains you run, including stops?

A. Twenty-five to thirty miles per hour.

33. Cross q. Could not, in your judgment, the trains on the Erie road have been stopped at stations without reversing the engine as a general thing, had the company thought proper to put a man, on an average, to each car—five hundred yards being given in which to stop—using the single brakes?

A. No; I don't think it could have been done.

Redirect:

41. Q. Which brake is most liable to slide the wheels of a car under the circumstances of average use on railroads, the single brake or the double brake?

A. The single brake is more liable to slide.

A. Why?

1775 A. Simply because the same power was applied as there is to the double brake. This power with the double brake is not enough to hold them so that they will slide under ordinary circumstances, yet there seems to be power enough in the double brake to do the work. With the single brake they had too much power.

43. Q. Suppose with the single brake they had reduced the leverage, and consequently the power—as you have testified could have been done—so that the brake would have had just power enough to stop the car without sliding the wheels under the circumstances of running on some particular day—would that brake, unchanged as to its power, have been an efficient brake on some other day, if the circumstances on such other day had required more power to be applied to the brake to stop the car than on the first day supposed?

A. I shouldn't think it would.

44. Q. Are the circumstances under which brakes are required to be applied to stop passenger trains always the same in the practical operation of railroads; or do they differ one day from another; if so, how do they differ?

A. They are not the same; there is some days a dry, clean rail—the weather is pure; other days the sun is very hot and has a great effect on the rail; other days are damp—there is moistness on the rail; and then there are variations in weight.

45. Q. Are there any differences in said circumstances as to whether the brakes have to be applied on grades, as compared with level portions of the track, and on curves as compared with straight portions of the track?

A. Yes, there is a difference, of course.

46. Q. To make a brake efficient for practical use—whether single or double—must it be adapted to stop a car without under ordinary circumstances sliding its wheels on the occasion when the force required,

1776 in view of the varying circumstances mentioned, is the greatest, or on the occasions when it is the least?

A. It must be adapted to the occasions when the greatest force is required.

47. Q. Suppose a single brake has its leverage so reduced that it is capable of exerting on its truck no more power than would be exerted by a double brake on that same truck—would it or not be an efficient practical brake under all the varying circumstances which you have mentioned?

A. No, sir, it would not.

48. Q. According to your observation, have the relative lengths of the arms of the truck levers in the double brake—or in other words the "leverage" of the double brake—been changed from the "leverage" which the single brake had?

A. No, sir.

49. Q. Would it be practically possible, as a general thing, on a train of cars having single brakes, for all the brakemen to apply the brakes simultaneously?

A. No, sir.

5. Q. If not applied simultaneously in a train having single brakes, what is liable to be the result as to more or less of the wheels of the train?

A. The train wouldn't be checked so suddenly, and they would be more liable to slide the wheels.

51. Q. Suppose the brakes of a train having *double* brakes are not all applied simultaneously, is there any reason why, notwithstanding that fact, the double brakes will still retard the train efficiently without sliding the wheels; and if so, what is the reason?

A. Yes, simply because the brakeman applies the brakes to both trucks of one car at the same time and gets the weight of that car at the same time towards stopping the train.

52. Q. Suppose the same car had a single brake on each end of it and a brakeman to each of these brakes—would these two brakemen,
1777 as a general thing, be able to apply the said brakes simultaneously, so as to get the whole weight of that car at the same moment towards stopping the train?

A. No, sir.

53. Q. Would this, as a general thing, be true of all the cars in a train—under the circumstances supposed?

A. Yes, sir.

54. Q. You have stated that passenger cars at the present day are much heavier than they formerly were; assume them to be twice as heavy now as formerly, and suppose single brakes to be put upon them, one on each end, with the same leverage which single brakes had when they were formerly used on passenger cars—would the wheels on the heavier car be as liable or more liable to slide than the wheels under said lighter car?

A. The lighter car will slide easier than the heavier one.

55. Q. If single brakes were to-day placed upon the passenger cars of to-day—one brake on each end of the car, if preferred—but with no more leverage than the single brake had when used formerly on passenger cars, would such single brakes be capable of doing efficient braking?

A. No, sir.

56. Q. Would such single brakes placed on the passenger cars of to-

day, but with no more leverage than formerly, be as efficient for such passenger cars as they were for the passenger cars of former days ?

A. I think they would not.

57. Q. Which is the easier to stop in a given time at a given speed, a car weighing ten tons or a car weighing twenty tons—relying, I mean, only on the brake ?

A. A car weighing ten tons.

58. Q. Now, of how much practical use would a brake adapted to stop only a ten ton car, under the ordinary circumstances of train running, be when used upon a twenty ton car, if the latter car had to
1778 be stopped in the same time as the former car—the speed being the same in each case ?

A. I shouldn't consider it a practical brake on a twenty ton car.

59. Q. To make it a practical brake for the twenty-ton car, would or not its leverage require to be increased proportionately to the increased weight of the car ?

A. Yes, sir.

60. Q. Then, if so increased, would or not the same consequences ensue which ensue on the ten ton car ?

A. Certainly they would.

61. Q. In your 26th cross-answer you stated that you could graduate the power of a single brake so as not to slide the wheels, as a general rule, on fifty ton coaches any more than the double brake would slide them on twenty ton coaches; would a brake which never, under any circumstances, had power enough to slide the wheels of a fifty ton coach be an efficient brake, in practical railroading, for such a coach ?

A. No.

Recross :

34. Cross q. Should you so graduate the power on a fifty ton car having single brakes as not to slide the wheels under ordinary circumstances, would such a brake, in your judgment, be an efficient brake, each brake having the power to slide wheels on a wet or frosty track, but not on a dry track ?

A. I should not think it was an efficient brake for ordinary use.

35. Cross q. Why not—since it has the elements of an efficient brake, to wit, to slide or not slide the wheels according to the condition of the track ?

A. Why, simply because you get the weight of one end of the car upon it. It is an efficient brake for one truck, but not for the whole car.

1779 36. Cross q. Now apply the same brake to the other end of the same car—and suppose both brakes to be operated simultaneously by two brakemen—would such a brake, in your judgment, be efficient in stopping the car ?

A. No; I shouldn't think it would.

37. Cross q. Please give your reasons for such opinion.

A. Both brakemen would not, as a general thing, apply the brakes at the same time, and the one applying the brake first would be very apt to lock the wheels of his truck so that they would slide; the consequence would be that that truck would slide while the other would be rolling, which wouldn't have the same effect as if both were rolling.

38. Cross-q. Suppose the brakemen did not apply the brakes so as to lock the wheels of either truck, but applied them simultaneously, would the brakes under such circumstances be efficient in stopping the car ?

A. Yes.

39. Cross-q. Now suppose the two brakemen do not apply the brakes of both trucks simultaneously into a second, or even two seconds, but nevertheless do apply them effectually without sliding the wheels, would such application of brakes be efficient, practically speaking?

A. Well, running that car alone, it would be.

40. Cross-q. Supposing more cars were run in connection with this car in the same train, and were operated in like manner, would they all be efficient?

A. They would. Of course I take it for granted now that all the brakemen on all the cars apply their brakes at exactly the same time—but ninety-nine times in a hundred it can't be done.

41. Cross-q. Are all the double brakes in a train of cars applied simultaneously throughout the train?

A. No; they are not.

42. Cross-q. Has there been a change of leverage in applying
1780 brakes to cars on the Erie road corresponding to the change in the weight of cars on that road?

A. I think not, sir.

43. Cross-q. Has there been a change in the leverage on the cars of any other road corresponding to the change in the weight of cars, to your knowledge?

A. Not to my knowledge.

Redirect resumed:

62. Q. About how much of the time practically, under circumstances as they occur on railroads, could two brakemen, one on each end of a car, apply two single brakes on that car simultaneously?

A. They might do it once out of a hundred times.

63. Q. Is it necessary, in a train of cars having double brakes, that all these double brakes should be applied simultaneously throughout the train in order to do efficient braking?

A. It isn't necessary that they should be all applied at the same time.

64. Q. Why is it that the double brake will do more efficient braking, even although the brakes are not applied simultaneously throughout the train, than single brakes will under the same circumstances?

A. They are not so liable to slide the wheels.

Recross resumed:

44. Cross-q. What advantage, if any, is derived from the simultaneous action of the brakes of both trucks by the use of the double brakes over the application of the same brake, disconnected, by two brakemen?

A. I don't see as there is any, provided you connect the two brakemen.

1781 45. Cross-q. What would be the difference provided the brakemen were not connected, but should get their brakes set thoroughly, but not so as to slide the wheels, but should differ a second or two in the time of application?

A. The difference would be some, of course, but very little.

46. Cross-q. Would it be so much as to essentially affect the stopping of the car in the quickest possible time, provided all the power had been applied to both trucks by the two brakemen that the wheels are capable of receiving without sliding?

A. It would make a trifling difference.

47. Cross-q. Would that trifling difference be of any essential importance, practically speaking, in stopping a train?

A. Yes, it would.

48. Cross-q. Why would it?

A. It is simply this: In case a train was ahead of me, probably in that second of time I could save train, engine, life, and everything else.

J. P. MARTIN.

ALBERT BRIDGES, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. Albert Bridges; age, fifty-nine; residence, Jersey City; business, railroad supplies.

2. Q. How long have you been in the business of railroad supplies, and how extensively are you engaged in it?

A. Twenty years; I have always been very extensively engaged in it.

1782 3. Q. Were you ever practically engaged in building railroad cars; if so, where, when, and for about how long?

A. Yes; at Cambridgeport, Mass.; from 1834 to 1850.

4. Q. How extensively were you engaged in building railroad cars in those years?

A. Very largely.

5. Q. What kind of brakes did you put on to passenger-cars built by you in those years, and how many to a car?

A. I put on single brakes, one on each end, braking only on four wheels at a time.

6. Q. Please state what was the average weight of railroad passenger-cars used on American railroads in those days?

A. The average weight of the first eight-wheel cars up to 1850 would average about nine tons—not exceeding eleven. We built the first eight-wheel cars which were used in New England—these we built in 1838 or 1839.

7. Q. What opportunities did you have while building cars to know the weight of cars built by other builders?

A. My opportunities were, being conversant with the construction and being often called to examine different constructions of cars; I judge from my former experience.

8. Q. What opportunities have you had in your railroad supply business, since you left off building cars and down to the present time, of knowing the weight of passenger cars used on American railroads?

A. I have always been so connected with railroads, and from my former experience, that I have often been called upon to give my opinion about the construction of cars on different railroads.

9. Q. Have these things made you familiar with the weight of passenger cars during the time referred to?

A. Yes.

1783 10. Q. What is the average weight of ordinary passenger-cars running on American railroads at the present time?

A. They will average at the present time about eighteen tons—not far from that.

11. Q. State, if you know, what is the average weight of the sleeping and drawing-room cars used upon railroads at the present time—for instance, the Pullman cars?

A. I should think the average weight of them would be about twenty-five tons, to the best of my judgment.

12. Q. State, if you know, what was the average weight of the ordinary passenger-cars on the Erie road twenty years ago?

A. I should think they were about fourteen tons.

13. Q. State, if you know, what is the average weight of the ordinary passenger-cars on the Erie Railway at the present time?

A. They will average about eighteen tons and a half—this is for their four-wheel truck-cars; their six-wheel truck-cars will weigh about twenty tons.

(Cross-examination waived.)

ALBERT BRIDGES.

1784 TUESDAY, *Nov.* 14*th*, 1871.

JOSHUA P. MARTIN, recalled on behalf of the complainant.

1. Q. In your testimony here, a few days ago, you spoke of the passenger cars on the Erie Railway weighing fifty tons. Have you any explanation to make?

A. Yes, sir. I should have said fifty thousand pounds—average weight.

2. Q. You have also spoken of the wheels sliding under the cars while using the single brakes. What, if anything, did you observe when the brakes were applied to the wheels, and the wheels were sliding upon the track?

A. As a general thing, my observation is that sparks of fire are passing from the wheels.

3. Q. What effect, if any, have you noticed on the surface of the wheel after they have been sliding on the track?

A. There appears to be a flat polished surface.

Cross-examined by M'r Whipple:

1. Cross-q. Have you noticed the operation of single brakes on the twenty-five ton cars on the Erie road?

A. I have not, to my knowledge.

2. Cross-q. What was the weight of the cars on which you noticed the effect of single brakes?

A. Well, I should judge they weighed about twelve to fourteen tons.

3. Cross-q. While the single brake might cause the sliding of wheels on a twelve to fourteen ton car, would the same brake, with the same leverage and same power applied, cause the wheels to slide on a twenty-five ton car?

1785 A. I don't think I could answer that exactly, from the fact that I have no knowledge of seeing the single brake on a twenty-five ton car.

4. Cross-q. What is your judgment in the matter inquired of, as a railroad man and mechanic?

A. Well, with regard to that, I simply judge that it would be owing to the weather and the condition of the rail—that the single brake would probably slide the wheels of a twenty-five ton car.

5. Cross-q. All the circumstances and conditions being equal, would the single brake be as liable to slide the wheels of a twelve ton car as it would the wheels of a twenty-five ton car?

A. Yes, sir.

6. Cross-q. Assume that the double brake is applied to the twelve ton car, and a single brake to the twenty-five ton car, would the brake on the former be just as liable to slide the wheels as the brake on the latter—the circumstances and conditions of the track being the same?

A. I think that the single brake would be more liable to slide the wheels than the double brake, by a brakeman using it by hand.

7. Cross-q. Is there not more weight resting on the truck to which

the single brake is applied than on both trucks to which the double brake is applied, as assumed in the preceding question?

A. There is a trifle more on the truck of the twenty-five ton car than on the two trucks of the twelve ton car.

8. Cross-q. Is it or not a law in developing friction force that the heavier the body to be controlled the more power is required to bring it to rest when in motion, all the conditions being the same?

A. Yes.

9. Cross-q. Then may not the single brake on one truck of a twenty-five ton car—all the circumstances being the same—be just as
1786 effectual in developing friction force, as a double brake on a
twelve ton car?

A. I think not.

10. Cross-q. Please give your reasons for this answer.

A. My reason is simply this; that a man drawing the single brake on, knowing that he has only got the four wheels to operate with, will use his whole strength and power, and is liable to slide the wheels, where the brakeman on the double brake, knowing that he has eight wheels to bear on, will not use his whole strength and power.

11. Cross-q. In this answer, do you take into account that the car with the double brake on weighs but twelve tons, while the one with the single brake weighs twenty-five tons, and that in both cases circumstances and conditions of the track are the same?

A. I do.

J. P. MARTIN.

Edward S. Renwick, being duly called and sworn on behalf of the complainant, testified as follows:

1. Q. What is your name, age, residence, and profession?

A. Edward S. Renwick; age, forty-eight; residence, Milford, New Jersey; I am by profession a civil and mechanical engineer.

2. Q. Have you been accustomed to the examination and comparison of letters patent and inventions; have you had opportunities for acquiring knowledge upon mechanical subjects, and if so, what opportunities; and have you frequently been examined as expert in patent causes?

1787 A. I have been accustomed to the examination and comparison
of letters patent and inventions. I was engaged in the construction and superintendence of machinery for about ten years before I became engaged in my present occupation. For the last twenty-two years I have been engaged in acting as expert in the trials of patent causes, and in soliciting patents; and during this period have had to examine a great number of patents and descriptions of machinery for performing numerous operations in the useful arts. I have frequently been examined as expert in patent causes, and for the last four or five years have frequently been called upon to testify in four cases a month.

3. Q. Have any of these cases in which you have been called as expert involved branches of railroad machinery?

A. They have.

4. Q. Have you read a certified copy of the letters patent of the United States, issued July 6th, 1852, to Henry Tanner, as the assignee of Batchelder & Thompson, and examined the drawing annexed thereto? If yea, do you understand the same and the invention therein described?

A. I have read a certified copy of the patent recited in the question, and believe I understand the invention recited therein.

A. Have you read the printed record of testimony taken in the present cause to be used before the master upon the accounting herein, as far as it has progressed, and do you understand the same?

A. I have read it, and believe that I understand it.

6. Q. Are you familiar with the construction and operation of the form of railroad-car brake known as the "single-acting brake"?

A. I was familiar with it some years ago, but I have not lately observed that form of brake in operation.

1788 7. Q. Will you look at the model now shown you and state what it represents?

A. It represents the running-gear of an eight-wheel car, with a single-acting brake applied to the wheels of each truck. The levers of the brakes of the two trucks are arranged in different ways, but the arrangements are substantially equivalent, the brake-shoes of one truck only being commanded by the brake-windlass at the adjacent end of the car-frame.

(Counsel for the defendants here admits that the model shown the witness is a correct model of two different ways of arranging what is known as the single-acting car-brake.)

8. Q. Will you state what, if anything, there is in the construction and arrangement of the single-acting car-brake which would be likely to cause the car-wheels to which it is applied to slide on the track under the ordinary circumstances of the application of car-brakes in practice?

A. In all the systems of brakes that I have seen in operation, the construction is such that a brakesman, by exerting the force which he is capable of exerting, can produce so much friction upon the wheels that they will cease to revolve, and will therefore slide upon the track. The object of a brakesman, when the signal is given to put down the brakes, is to check the movement of the train as rapidly as possible, and in doing this he will naturally exert his force as rapidly as possible until he notices that the speed of the train begins to slacken. In the single-acting system of brakes, each brakesman commanded the shoes of but four wheels, and the application of friction to them would check the speed of the train much less rapidly than the application of friction to eight wheels, as is accomplished by the double-acting system of brakes.
1789 Hence the brakesman, when operating with the single-acting brakes, would be much more likely to exert the amount of force required to stop the wheels and cause them to slide than he would when operating with the double-acting system. There may also be cases where the proportion of the brake-levers of the double-acting system, as compared with the single-acting system, is such that only half the amount of pressure can be applied to each brake-shoe of the double-acting system, as to each of the single-acting system, by the same application of force to the brake-wheel. As in such cases the force is divided up among eight wheels, instead of among four, the risk of producing sufficient friction upon any one wheel to stop its revolution, and cause it to slide, would be greatly reduced.

9. Q. In which condition of the car-wheels will they retard the motion of the train most efficiently, when they are checked by the brakes so as to revolve very slowly, or when they slide upon the track?

A. They would retard the motion of the train more efficiently when they continue to revolve under the pressure of the brakes than when they slide upon the track without revolving.

10. Q. Can you state the reason of this?

A. In my opinion, there are two reasons which affect the matter. In the first place, the effect of the sliding upon the track of the exceedingly small portion of the surface of the wheel which is in contact with it, and under the pressure of the car, is to produce an immense amount of friction upon the small surface of the wheel, and to generate intense heat; so that I have no doubt the particles of iron abraded from the wheel are softened sufficiently to act as an imperfect lubricator between the sliding surface of the wheels and the track, thereby reducing the friction so that the friction of the wheel upon the track is less than the friction of the wheel when revolving against the brake-shoe.

1790 In the next place, the effect of the sliding is to polish the surface of the wheel which is in contact with the rail, which also tends to reduce the friction.

11. Q. Assume that when the brakes are applied to the wheels with sufficient force to cause the latter to slide, sparks come from the point of contact of the wheels with the rail, what would that indicate, in your judgment?

A. It would indicate that the particles of iron abraded from the wheel are heated so intensely hot as to burn in the atmosphere; or, in other words, that they are heated to a high white-heat, when the iron is either very soft or else actually melted.

12. Q. In this condition of the iron at said point of contact, what would be the effect on the wheel as to holding the train?

A. The effect on the wheel to hold the train would be reduced, as the heated particles of iron, before their escape from between the two surfaces, would act as a lubricator to reduce the friction between the surface of the wheel and the track.

13. Q. In your eighth answer, you spoke of cases in which the proportion of the levers in the double-acting brake system, as compared with the single-acting system, may be such that only half the amount of pressure can be applied to each brake-shoe of the double brake that is applied to each shoe of the single brake by the same application of force to the brake-wheel. Will you please look at the drawing of the above-mentioned patent to Henry Tanner, and state what would be the amount of pressure exerted by the brakeman upon each brake-shoe if the rods marked "H^3" and "G^3," in said drawing, were carried out to the ends of the centre lever marked "A^1," as compared with the pressure when they are connected to said centre lever at the points represented in said drawing.

1791 A. If the rods H^3 and G^3 were applied to the ends of the central brake-lever, the brakesman could exert less than half as much pressure upon each brake-shoe as he could when the same rods were arranged as in the drawing, assuming that in each car he applied the same force to the brake-wheel.

14. Q. Will you please state what are the relative lengths of the arms of the brake-levers of the trucks, as represented in the drawing of said patent?

A. They are about as seven to twenty-two (7 to 22) in one truck, and six to twenty-two (6 to 22) in the other.

15. Q. You also stated in your eighth answer that a brakeman would check the speed of a train much less rapidly with the single-acting brake, commanding the shoes of but four wheels in a car, than he would in the double-acting system. Suppose there be one of these single brakes upon each end of a given car, and suppose a brakeman be provided at each of these single brakes, what would be the effect, as regards the tendency to slide the wheels of that car, as compared to the same car, under the same circumstances, but provided with a double-acting brake operated by one brakeman?

A. I think the presumption is, there would be a greater tendency to slide the wheels with the single brakes than with the double brake, and the tendency would be much greater to slide with the single brake if the levers of the double brake were so arranged that only about half the pressure could be exerted against each shoe as against each shoe of the single brakes, when the same amount of force was applied to the brake-wheel.

16. Q. Please look at the drawing annexed to the said Tanner patent, and also at the model which was shown you a little while ago of the single brake, and state if there is any difference in the amount of pressure that can be applied to the brake-shoes in these different forms of brakes; and, if so, in which the pressure is the greatest.

1792 A. Assuming that the brake-standards in the two cases compared and the brake-wheel are of the same dimensions, a greater amount of pressure can be exerted upon each shoe of the Tanner brake represented in the drawing than can be exerted upon each shoe of the single brake represented in the model, the same amount of force in each case being exerted upon the brake-wheel.

17. Q. Please state to what this is owing.

A. It is owing primarily to the fact that in the Tanner brake the rods H^3 G^3 are connected with the centre lever at points nearer the fulcrum of that lever than half the distance from that fulcrum to the ends which are connected with the brake-standards; so that the pressure exerted in each truck is greater than the amount of pressure exerted upon the end of the centre lever by the application of force at the brake-wheel. It is due secondarily to the fact that the proportions of the arms of the truck levers in the Tanner brake represented in the drawing differ from those of the truck-levers of the model, and the difference is in the proper direction to increase the pressure upon the brake-shoes of the Tanner brake, as compared with those of the model brake, when the same force is applied to the upper ends of the truck levers.

18. Q. Please also answer the last two questions upon the assumption that the proportions of the arms of the brake-levers in the trucks are the same in the single brake and in the Tanner brake.

A. Assuming in such case that the brake-standards in the two constructions compared and the brake-wheels are of the same dimensions, a greater amount of pressure can be exerted upon each shoe of the Tanner brake represented in the drawing than can be exerted upon each shoe of the single brake the same amount of force in each case
being exerted upon the brake-wheel. The reason is, that in the
1793 Tanner brake the rods H^3 G^3 are connected with the centre lever
at points nearer the fulcrum of that lever than half the distance from that fulcrum to the ends which are connected with the brake-standards; so that the pressure exerted in each truck is greater than the amount of pressure exerted upon the end of the centre lever by the application of force to the brake-wheel.

19. Q. Please look at the certified copies now shown you of letters patent issued to Nehemiah Hodge, October 2d, 1849, and to Francis A. Stevens, Nov. 25th, 1851, and state whether you understand the construction and arrangement of the car-brakes represented in those patents respectively.

A. I have examined the certified copies referred to the question, and believe that I understand the construction and arrangement of the car-brakes represented in each of those patents.

20. Q. Please compare the said Hodge and Stevens brakes with the single-acting car-brake, and assume that the truck-levers, brake-staffs, and brake-wheels of all the said brakes compared are of the same pro-

portions, and state in which of these brakes the pressure upon each truck is greater, if there be any difference.

A. The amount of pressure upon each truck in each of the three cases mentioned is substantially the same when the brakes are bearing upon the wheels and the same force is applied to each brake-wheel.

21. Q. Please state what difference, if any, there is in the practical effect as to stopping a railroad train between the Tanner brake, the Hodge brake, and the Stevens brake.

A. If the amount of force applied to the brake-wheel in each case be less than sufficient to stop the revolution of the wheels, there would not, in my opinion, be any material difference in the practical effect of the three brakes; but when the force exerted amounts to enough to
1794 stop the revolution of the wheels, four of the eight wheels in the Tanner and Hodge brakes would probably cease to revolve before the remaining four, while in the Stevens brake the presumption is that the whole eight would be stopped nearly at the same moment. It would also be possible with the Stevens brake to apply a little more force to the brake-wheel before any of the wheels stopped than could be applied with the Hodge brake and the Tanner brake before any of the wheels would cease to revolve. I have made this answer under the assumption that the proportions of the central levers in the Hodge brake and the Tanner are substantially the same as those represented in the drawings of the patents respectively.

22. Q. In the case of the Stevens brake, is it theory or practice that the whole eight wheels are stopped at the same moment?

A. According to theory they ought to stop at the same moment, but the presumption is that in practice the wheels of the truck that is nearer the brake-wheel upon which the brakesman operates will stop before the wheels of the other truck, because the friction of the connections will really neutralize a portion of the force tending to be transmitted to the farther truck.

23. Q. What difference, if any, is there in the construction of the parts in the trucks between the Tanner brake and the Hodge brake?

A. There is none substantially.

24. Q. What are the relative lengths of the arms of the brake-levers in the trucks in the Hodge brake, as represented in the Hodge patent before you?

A. They are about eight to eleven (8 to 11).

25. Q. Suppose a railroad train to consist of six eight-wheeled cars, each car weighing ten tons, and a second train containing the same number of cars, but each car weighing about eighteen tons. Now suppose such trains to be running at the same speed and under the
1795 same circumstances, what is the law of momentum in such case, and what are the relative amounts of force required to stop the two trains?

A. The momentums of the two trains under the same circumstances would be in the proportions of the respective weights of the cars, or as ten (10) for the lighter car, to eighteen (18) for the heavier; and the relative amounts of forces required to stop the two would be in the same proportions.

Cross-examined by Mr Whipple:

1. Cross-q. Please look at drawings in Tanner brake patent, and at model of single brake—the same as admitted by defendant to be such in this case—and state which brake mechanism, if applied to separate cars, as represented in drawings and in model, would be the least liable

to slide the wheels, the power applied to the brakes in both cases, the weight of the cars, and the condition of the track, being the same.

A. If in neither case the power applied to the brake standard is sufficient to stop the wheels, there would not be any greater liability to stop the wheels with the one brake than with the other.

2. Cross-q. Suppose the same power, under the same circumstances, were applied to the brake wheel of the Tanner brake, the mechanism being the same as represented in the drawings, and the same power applied to the brake-wheel of the single brake as represented in the model—which mechanism, all the conditions being the same, would convey the most power to the wheels in both cases?

A. Assuming that the language, "under the same circumstances," requires, among other things, that the brake-wheels and the brake standards are to be the same in the two cases, but does not require that the proportions of the arms of the brake-levers shall be changed from the proportions represented respectively in the drawing of the Tanner patent and the model, the Tanner mechanism would apply the greatest pressure to the brake-shoes of the wheels. 1796

3. Cross-q. Would that pressure, in your judgment, be sufficient to slide the wheels under ordinary circumstances?

A. As the amount of pressure is not stated in the question, it is impossible for me to give a definite answer to the question. The Tanner system and the single-brake system are each so constructed that force sufficient to cause the wheels to slide on the track can be applied in each case.

4. Cross-q. Do you deem it necessary to make any modification of the leverage as represented in the drawings of the Tanner patent in order to prevent the sliding of the wheels?

A. As I have never had occasion to keep an account of the operation of the Tanner brake on a railroad, it is not possible for me to answer the question from my own knowledge. From what I have observed of the operations of brakes on railroads and of the manner in which the brakesmen apply the brakes, I should modify the proportions of the leverage, if I wished to prevent, as far as possible, the possibility of sliding the wheels.

5. Cross-q. Have you not stated in your direct examination, that the Tanner brake, as represented in the drawings, applied to a car, would apply more pressure to the wheels of each truck than would be communicated to the wheels in the truck of the single brake, as represented in the model?

A. I have, in substance, assuming that the same force was applied to the brake-wheel in each case.

6. Cross-q. Which brake, in your judgment, would be likely to slide the wheels of a car—the Tanner, the Hodge, or the Stevens brake—the size of the brake-wheel and the power being the same?

A. If the power applied to the brake-wheel in each case be less than sufficient to cause the wheels to slide, there will be no greater likelihood of causing the wheels commanded by one brake system to slide than those commanded by either of the others. Assuming that the proportions of the brake-levers in each system are the same as those represented in the drawings of the respective patents, but that the brake-wheels and brake-standards are the same in all three, the wheels of a car having a brake on the Tanner system could be caused to slide by a less application of force to the brake-wheel than was required in the other two systems to produce the same effect. 1797

7. Cross-q. Please give your reason for the last part of your answer.

A. The reason is that the proportions of the levers as represented in the drawings of the Tanner patent are such as to give the force applied to the brake-wheel a greater mechanical advantage, as respects the application of pressure to the brake-shoes, than in the other two cases.

7. Cross-q. Assume that the proportions of the levers in each truck are the same—would this modify the latter part of your answer to the sixth cross-question?

A. It would not change the general fact, as stated, because the relative operative length of the *the* arms of the center lever of the Tanner brake as represented in the drawings of the Tanner patent are such as to give the force operating upon the brake-wheel a greater mechanical advantage over the brake-shoes than is given by the levers of the other two systems, even under the assumption that the relative lengths of the truck levers of all three are the same.

9. Cross-q. Which brake, practically, gives the more equal distribution of power between the trucks—the Tanner brake or the Hodge brake?

A. If the brake is in the best possible condition in each case, there is no appreciable difference between the two; but the Hodge arrangement permits of a considerable variation in the brake-shoes and
1798 connections, by wear or otherwise, without materially varying
the equality of distribution between the two trucks—this difference in result being due to the fact that in the Tanner system the fulcrum of the centre lever is fixed, while in the Hodge brake the fulcrums of the two cross-levers are movable, and adjust themselves to variations in the brake-shoes and in the connections.

10. Cross-q. In case the brake-shoes of a Tanner brake in one truck happen to be of a soft material, and those in the other truck of a hard material, how would such condition of the shoes affect the application of pressure to the wheels, as the brake continued in use?

A. The distribution of the pressure would be affected by a number of circumstances which are not mentioned in the question, and therefore it is impossible to give an answer which would apply to every case that the question would include. If the brakes were all carefully adjusted, the application of the pressure to the wheels of the truck having the shoes of soft material would be precisely the same as that to those of the truck having the brake shoes of the hard material, but what would take place after the first application of pressure it is impossible for me to state. It might turn out that the harder shoes would in fact wear faster than the softer shoes, with the same pressure, or might wear slower. In the former case, after wear commenced there would probably be less pressure upon the wheels of the truck having the harder shoes than upon the wheels of the other truck; and in the latter case there would probably be more pressure. How much less or how much more pressure there would be, I cannot say, as I should have to experiment upon the materials of which the shoes were composed so as to find the law of their wear under the circumstances occurring in practice, in order to enable me to answer the question.

1799 Redirect:

26. Q. You have stated in the cross-examination that with some forms of the double brake the pressure applied to the brake-shoes in each truck is the same as in the single brake, and that with one form it is greater, the proportions of the truck levers, as you have said, being assumed to be the same in all the cases. The witnesses who have testified thus far in the case state that when the single brake was employed

on cars it was a very frequent thing to slide the wheels, and that with any of the forms of double brake in use, sliding of the wheels very seldom occur. In view of all these facts, to what, in your judgment, is the difference between the double brake and the single brake, in respect of this sliding wheels, due?

(Objected to.)

A. In my opinion it is due to two causes, viz: First, that when the single brake has been used there have not been a sufficient number of brake-shoes put in operation to stop the train in the time permitted for the purpose, and, second, that when the single brake was used, a brakeman could only operate simultaneously upon half the number of brake-shoes that he can when double brakes are used.

Recross:

11. Cross-q. Could not, in your judgment, the same effective work in stopping a train be done with the single brake by increasing the number of brakemen?

A. So far as the mere stopping of the train is concerned, I do not know that there would be any great difference between the effect with the single brake and the double brake, assuming that brakesmen
1800 enough were used with the single brake to put the same number of brake-shoes in operation as were put in operation when the double brakes were used.

E. S. RENWICK.

U. S. circuit court, northern district of Illinois.

Thomas Sayles
vs.
The Chicago & Northwestern Railroad Company.

Testimony upon final accounting before the master, taken in the city of New York in pursuance of agreement between the counsel for the respective parties above named, this fourth day of January, A. D. 1872, as follows:

William H. Marlue, a witness duly called and sworn on the part of Thomas Sayles, the above-named complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is William H. Marlue; I am 29 years of age; reside in Jersey City; and am engaged in railroading.

2. Q. Have you ever been engaged as brakeman on railroad trains; if so, how long and what kind of trains?

1801 A. I have been, on local freight, through freight, and passenger-trains; I have been a brakeman about nine years.

3. Q. About how much of this time have you been brakeman on passenger-trains?

A. About half the time, and the rest on freight-trains and shifting in the yard.

4. Q. Please mention some of the roads on which you have been engaged as brakeman during the said nine years.

A. The New Orleans & Jackson; the Mobile & Ohio; Vicksburgh & Meridian; Opelousas; Camden & Amboy; New Jersey.

5. Q. When you were engaged as brakeman on the passenger-trains on these various roads what kind of brakes, whether single-acting or double-acting, did the passenger-cars have?

A. Double-acting.

6. Q. While acting as brakeman on these passenger-trains on these roads, about how much strength did you use at the brake-wheel when stopping the trains at stations on ordinary occasions and at their average speed?

A. I used all the exertion I conveniently could.

7. Q. What, if any, difference was there in respect of the strength used at the brake-wheels between these passenger-trains and the freight-trains you braked on?

A. There was no difference; I set both as tight as I could conveniently.

8. Q. What kind of brakes were used on these freight-trains on which you acted as brakeman?

A. Single-acting brakes, acting only on one truck. At the present time, they have double-acting brakes on the freight-cars of the New Jersey Railroad.

9. Q. State, if you recollect, what kind of double-acting brakes were used on the passenger-cars of the Southern railroads which you mentioned.

1802 A. Some of them had double brakes with a cross lever under the centre of the body of the car, and others had double-acting brakes with two upright levers in each truck.

WILLIAM H. MARLUE.

Sworn to before me this 4th day of January, 1872.

[L. S.] T. B. BEECHER,
Notary Public, N. Y. County.

Frank Singer, a witness duly called and sworn on the part of Thomas Sayles, the above-named complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Frank Singer; I am 24 years of age; reside in Jersey City, and am a baggage-master on passenger-train running from Jersey City to Perth Amboy.

2. Q. Have you ever been engaged as brakeman on railroad-trains; if so, how long and what kind of trains?

A. I have been. I was brakeman for four years on passenger-trains. I was never brakeman on freight-trains.

3. Q. What kind of brakes—whether single-acting or double-acting—were used on the cars on these passenger-trains on which you were brakeman?

A. Double-acting.

4. Q. While acting as brakeman on these passenger-trains, about
1803 how much strength did you use at the brake-wheel when stopping the trains at stations on ordinary occasions and at their average speed?

A. As much as I could.

FRANK SINGER.

Sworn to before me this 4th day of January, 1872.

[L. S.] T. B. BEECHER,
Notary Public, N. Y. County.

Edward M. Robinson, a witness duly called and sworn on the part of Thomas Sayles, the above-named complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is Edward M. Robinson. I am 27 years of age; reside in Newark, N. J., and am a baggage master on a passenger train running from Jersey City to Rahway.

2. Q. Have you ever been engaged as brakeman on railroad trains; if so, how long and what kind of trains?

A. I have. I was brakeman fourteen months on a train of mixed freight and passenger cars.

3. Q. While you acted as brakeman, about how much strength were you in the habit of exerting on the brake-wheel—on ordinary occasions and while the train was at its average speed—in stopping at stations?

A. I generally put on all the strength I could.

EDWARD M. ROBINSON.

Sworn to before me this 4th day of January, 1872.

[L. S.] T. C. BEECHER,
Notary Public, N. Y. County.

1804 NEW YORK, *January* 12, 1872.

JOHN A. SHARP, a witness duly called and sworn on the part of Thomas Sayles, the above-named complainant, testified as follows:

1. Q. What is your name, age, residence, and occupation?

A. My name is John A. Sharp. I am 56 years of age; residence in Newark, N. J., and am a baggage-master on the Morris and Essex Railroad.

2. Q. Have you ever been engaged as brakeman on railroad trains; if so, how long and what kind of trains?

A. I have. I have been brakeman on passenger trains for five to seven years, and have been baggage-master for seventeen years. I have to apply the brake in my baggage-car every day. I have been on the Morris and Essex Railroad all this time.

3. Q. When you first commenced as brakeman, what kind of brakes were used on the passenger trains on the Morris and Essex road?

A. Single brakes—acting only on one truck.

4. Q. How long was the single brake used on passenger trains while you were brakeman on said road?

A. For a number of years; then the double brake was put on the cars—the Hodge brake, I believe it is called. During the last two years the Hodge brake has been taken off the cars, and the double-acting centre lever brake has been put on all our cars.

5. Q. About how much strength did you apply to the windlass, while using the single brake, when the train was at its average speed, in stopping at stations?

A. About all the strength I could conveniently.

6. Q. And how much of your strength did you apply at the 1805 windlass, while using the double brake, in stopping at stations, when the train was at its average speed?

A. I don't know as there was any difference. I used about all the strength I could in both cases.

7. Q. Did you continue to use about all the strength you could at the windlass until the train came to a full stop?

A. When using the single brake I used to set the brake up as tight as I could, and hold it there till the train stopped; but with the double brake I had better control of the train, and when I could see the train slack I used sometimes to ease up on the brake a little before the train stopped. When the single brake was used the wheels would slide, and the brake didn't hold so well. But with the double brake the wheels were not so liable to slide; after the double brake was put on we had more control over the train.

JOHN A. SHARP.

Sworn to before me this 12th day of January, 1872.

[L. S.] T. B. BEECHER,
Notary Public, N. Y. County.

1806 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILROAD Company.
} In equity.

Testimony of Oliver H. Lee, Charles H. Frisbie, John Ebbert, and James M. Cotting, taken in the matter of the final accounting before H. W. Bishop, esq., master in chancery of said court, before E. B. Sherman, notary public in and for the city of Chicago, in the district aforesaid, by agreement of the attorneys of said parties, complainant and defendant, at the office of West & Bond in said city, at the several times in the jurats of said respective depositions specified.

The said witnesses, being severally duly sworn, testified and deposed as follows on the part of said complainant:

OLIVER H. LEE, a witness of lawful age, being produced, cautioned, and solemnly sworn to testify the truth, the whole truth, and nothing but the truth, in the matter in controversy aforesaid, in answer to interrogatories to him propounded, deposed as follows, to wit:

Q. 1. What is your name, age, residence, and occupation?

A. Oliver H. Lee; 57 years; Chicago; merchant.

1807 Q. 2. Were you at any time superintendent of the Hudson River Railroad? If yea, state when.

A. I was; during the years 1850, 1851, and part of 1852.

Q. 3. While such superintendent, were any experiments made by you, or under your direction, for the purpose of testing the comparative value of single-acting and double-acting brakes on railroad cars? State fully all facts connected with such experiments, if any such were made.

A. Such experiments were made under my direction; I referred the matter of brakes to W. T. Ragland, superintendent of car machinery on the said Hudson River Railroad, directed him to try the different kinds of brakes on the passenger cars on said railroad, test them thoroughly, and report to the company. The particular object of inquiry was to find the brake which would stop the cars soonest without injuring the wheels—I mean with the least wear on the wheel by sliding on the track while the train is in motion, thereby causing a flattened surface on the periphery of the wheel.

Q. 4. State when you directed these experiments to be made.

A. In the spring of 1852; I think I left the road in May, 1852; I left before the experiments were completed.

OLIVER H. LEE.

Subscribed and sworn to before me this 20th day of Dec., 1871.

E. B. SHERMAN,
Notary Public.

(Cross-examination waived.)

1808 CHARLES H. FRISBIE, a witness of lawful age, being produced, cautioned, and solemnly sworn to testify to the truth, the whole truth, and nothing but the truth, in the matter of controversy aforesaid, in answer to interrogatories to him propounded, testified as follows, to wit:

Q. 1. What is your name, age, residence, and occupation?

A. Charles H. Frisbie; 48 years; I reside in Rockford, Illinois; and am an engineer—a locomotive engineer.

Q. 2. How long have you been such engineer, and on what roads have you run?

A. Since 1850; Michigan Central, Chicago, Burlington and Quincy, Chicago, Pittsburgh and Fort Wayne, Chicago and Northwestern.

Q. 3. On what trains did you run on the Michigan Central Railroad, and what kind of brakes were used on such trains?

A. I run on passenger and also on freight trains. When I first commenced running on the Michigan Central, they used the single brake on the cars in the passenger trains; on the freight cars, generally, they then used no brakes, but on a few cars they had single brakes.

Q. 4. While such single brake was in use on passenger cars of the Michigan Central Railroad, did you, as engineer, have to do anything to assist in stopping trains at stations; and, if so, what?

A. I frequently had to reverse my engine, in order to stop the train at the proper place.

Q. 5. How frequently did you have to do this?

A. Such was the general practice among engineers at that time. We had instructions from the superintendent to stop the trains by reversing the engine, if they did not stop them with the brakes. Ordinarily I had to reverse the engine as often as every alternate station and sometimes oftener.

1809 Q. 6. Were the brakes upon the passenger cars of said railroad changed before you left it; if so, what change was made?

A. They were changed from single to double brakes.

Q. 7. What effect, if any, did this change have upon the facility with which trains could be stopped?

A. After we had the double brake we never had to reverse the engine except in special cases. For all ordinary cases, the brakes were sufficient to stop the trains.

Q. 8. On what trains did you run as engineer on the other roads you have mentioned?

A. Both passenger and freight.

Q. 9. What brakes have been used, if any, on the passenger trains of such roads, while you run as engineer—employed upon them?

A. None other than double brakes to my knowledge.

Q. 10. What means have been employed for stopping such passenger trains at stations?

A. The brakes alone have been sufficient in all ordinary cases; I have not found it necessary to reverse the engine to aid in stopping, except in special case—in cases of danger.

Q. 11. State what effect, if any, it has upon a locomotive engine to reverse it under headway as often as you have said it was necessary to do when single brakes were in use.

A. It had a tendency to make the flues leak; it made a very heavy strain upon the engine every time it was reversed, especially when under great speed; it strained every part of it. I recollect one occasion in particular that I reversed my engine under headway, and it disabled one side of her—one engine entirely; it broke her eccentrics and link and eccentric rods, breaking the engine throughout.

Q. 12. On what railroad were you running when you first saw double-acting car-brakes in use?

A. On the Michigan Central Railroad.

1810 Q. 13. What kind or construction of double-acting car-brake was first put in use on the Michigan Central Railroad?

A. The one with the lever under the centre of the car-body.

Q. 14. Upon what railroad are you running as engineer at the present time?

A. The Chicago and Northwestern.

Q. 15. How long have you run as engineer upon the Chicago and Northwestern Railroad?

A. Six or seven years.

Q. 16. During that time, have you run part of the time upon passenger trains upon that road?

A. Yes, sir.

Q. 17. State whether you found any difference, and, if any, what difference, between the facility with which you could stop the passenger trains at stations upon the Michigan Central Railroad, without reversing the engine, at the time when they used the car-brake having a lever under the centre of the car body, and the facility with which you could do the same thing on the passenger trains of the Chicago and Northwestern Railroad, with the form of double brake used on those trains.

A. I never could see any difference.

Q. 18. What kind of a train are you at present running on the Chicago and Northwestern Railway?

A. A way-freight train between Chicago and Rockford. That is ninety-three miles from Chicago.

Q. 19. About what is the average number of freight cars run in that train?

A. About fifteen cars, taking the whole year through, but all the way from fifteen to forty cars during the summer season.

Q. 20. Are the freight cars in that train of the ordinary weight and size of the other freight cars of the Chicago and Northwestern Railway, and of the other railroads in this section of the country?

1811 A. Yes; we have cars in that train from all the roads about here, except that I don't remember ever seeing any cars from the Pennsylvania road in it. The cars are of the average size and weight, taken all together.

Q. 21. What kind of brakes are used on the freight-cars of that train?

A. The single brake.

Q. 22. Is there any other car in that train except the freight-cars? If so, what kind of a car is it, and in what part of the train is it placed?

A. There is a car that we call a way-car; on some roads this kind of car is called a caboose-car. It always is run at the rear end of the train.

Q. 23. What kind of a brake is there on the "way" car in your train?

A. A double brake; it brakes on both trucks at the same time.

Q. 24. Of the cars of this train, which are relied upon by the men on the train to stop the train whenever it is necessary to stop it?

A. We put more reliance upon the way-car than upon all the rest of the cars in the train, always. There is more reliance to be put upon it.

Q. 25. State whether you ever hear any complaint from the brakemen on that train as to the brakes of the freight-cars; if so, what do they say about them?

A. They frequently tell me that after putting on half a dozen brakes they find that they can't hold the train with them. I have often asked them why they didn't hold the train, and they have said that they put the single brakes on and they didn't hold at all. They have often told me that there wer'n't any brakes on the train that were good for anything to hold the train except the brakes on the way-car.

Q. 26. Independent of what the brakemen say, what is your own experience of the effect of the single brakes on the freight-cars in holding your train?

1812 A. I could say with perfect safety, that according to my experience they are not worth much of anything to hold the train, generally speaking.

Q. 27. State, if it is within your knowledge, any reason why these brakes on the freight-cars don't hold the train any better.

A. One reason is, that I have frequently seen, when the brakes were on, that they held the four wheels of a car—that is, one truck—so that they would slide on the track; and when they slide on the track they don't hold so well as when they roll slowly.

Q. 28. State whether you are ever able to draw your train with your engine when a considerable number of the brakes of the freight-cars are on, the brake on the way-car not being on.

A. Yes, I have often done it. When the single brakes are on they don't seem to hold much. Anybody that hasn't had practical experience in these things wouldn't believe that these single brakes hold so poor as they do.

Q. 29. State whether you can draw your train when the brake of the way-car is put on.

A. Not generally, unless I am on a down grade or have got my train well under headway. Sometimes I can start my train with the way-car brake on, but I can't get a great ways without feeling it; and often when the men on the train want to stop it at some irregular place and can't get any signal to me on the engine, they put the way-car brake on, and I feel that right away, and know they want to stop, and I stop my engine. I have frequently known, when the train was under headway and then the way-car brake was put on, that it would tear the train in two, and break the pins and couplings; part of the train would be with the way-car and part with the engine.

Q. 30. About what is the average weight of freight-cars in your train, when they have an average load, and what is the speed at which they run?

A. On an average, from eighteen to twenty tons, including the car itself. The speed I run at is about fifteen miles an hour.

1813 Q. 31. How long have you run on that train?

A. Between four and five years.

Q. 32. What experience have you had in running trains on other railroads?

A. I ran freight trains most of the time I was on the Chicago, Burlington and Quincy Railroad, and most of the time I was on the Chicago, Pittsburgh and Fort Wayne road. I was running freight trains on these two roads, both together, about five or six years in all.

Q. 33. What kind of brakes were used on the freight cars on these last two mentioned roads when you ran them?

A. I never knew of any except the single brakes.

Q. 34. State whether on the freight trains on these last two mentioned roads there were any way or caboose cars; if so, how many to a train?

A. Yes, sir; each freight train on each road had one caboose car on the rear end.

Q. 35. What kind of brakes were on these caboose-cars on these roads?

A. The double brake.

Q. 36. In running these freight trains on these roads what brakes were relied upon to stop the trains?

A. The double brakes on the caboose-cars.

Q. 37. State, if you know, how generally it is the practice in this section of the country to run caboose or way cars on the rear end of freight trains.

A. They run them on all the roads running out of Chicago, and on all the roads I ever knew anything about everywhere.

C. H. FRISBIE.

Subscribed and sworn to before me, this 20th day of December, 1871.

(No cross examination.)

1814 JOHN EBBERT, a witness of lawful age, being produced, cautioned, and solemnly sworn to testify the truth, the whole truth, and nothing but the truth, in the matter in controversy aforesaid, in answer to interrogatories to him propounded, testified as follows, to wit:

Q. 1. What is your name, age, residence, and occupation?

A. John Ebbert; 55 years; Chicago; am an engineer. Have been the greater part of my life a locomotive engineer. Was several years master-mechanic of the Chicago & Galena road.

Q. How long have you been a locomotive engineer, and on what railroads have you been employed?

A. About 20 years—from about 1835 to about 1855. I was first on the Allegheny Portage road; afterwards on the Michigan Central Railroad; then the Galena & Chicago Railroad; then on the Ohio and Mississippi Railroad; also on the Western Railroad of Massachusetts, between Albany and Worcester. This last was after I left the Michigan Central. I mean immediately after.

Q. 3. What trains did you run on as engineer on these several roads?

A. Both freight and passenger, on each.

Q. 4. What brakes were in use on the passenger cars of these roads in the trains run by you as engineer?

A. The Allegheny & Portage road used four-wheel cars, and the brake used was a single-acting brake; on all the other roads single-acting brakes were used, operated from only one end of the car.

I went on the Galena road in the latter part of 1848; the single brake was then used on that railroad on its passenger cars, and continued so to be used until 1852 or 1853, when they commenced using double brakes, operated from either end of the car.

1815 Q. 5. While single-acting brakes were in use on the Galena road aforesaid upon the cars in its passenger trains, what, if anything, did you, as engineer, have to do in stopping such trains at stations?

A. I usually handled the trains at stations by reversing the engine to assist the brakes. I mean I had to reverse the engine to help stop the trains.

Q. 6. How many single brakes were in use on each car?

A. Some had one on each end, and some had only one.

Q. 7. After the double-acting brakes, as you say, were used on the passenger-cars on said Galena road, what, if anything, did you have to do, as engineer, to assist in stopping trains at stations?

A. It was seldom after the double brakes were used that we reversed the engine; the cars were handled by the brakes altogether. Sometimes at the water-tanks we reversed the engine after the train was, so to speak, stopped, because we had to get within six inches to get water.

Q. 8. While engineer upon the other roads which you have mentioned, what, if anything, was it customary for you, as engineer, to do in stopping, at stations, passenger-trains upon the cars of which single-acting brakes were in use?

A. We handled the train generally by reversing the engine to assist the brakes. Engineers generally did this on all roads I have been connected with.

JOHN EBBERT.

Subscribed and sworn to before me this 20th day of December, 1871.

E. B. SHERMAN,
Notary Public.

(No cross-examination.)

1816 JAMES M. COTTING, a witness of lawful age, being produced, cautioned, and solemnly sworn to testify the truth, the whole truth, and nothing but the truth, in relation to the said matter in controversy, testified as follows, to wit:

Int. 1. What is your name, age, residence, and occupation?

Ans. James M. Cotting; 45 years; Bloomington, Ill.; have been the greater part of my life railroading—part of the time as engineer, and part as conductor.

Int. 2. On what railroads have you been employed, and in what capacities?

Ans. On the Hudson River first two years—working in the car-shop, and one year running a stationary engine; afterwards on the Alton & S't Louis road as locomotive engineer and conductor of passenger-trains.

Int. 3. About what years were you employed on the Hudson River road, and under whom as master of car repairs?

Ans. 1851 and '52; Major W. T. Ragland was at that time master of car repairs.

Int. 4. At the time you first went on to the Hudson River road, what kind of brakes were in use in the cars in the passenger-trains of that road?

Ans. The single brake.

Int. 5. Was there at any time while you were employed there any change made in the brakes on the cars in the passenger-trains on said road; if so, what change was made?

Ans. There was; to the double-acting brake.

Int. 6. What experiments, if any, were made about the time that double brakes were put in the place of the single brakes, for the purpose of testing the comparative value of the two kinds of brakes? State whatever you know about this matter.

1817 Ans. About that time some experiments were made by Major Ragland; but what the exact nature of the experiments were, or the result, I don't know.

Int. 7. While you were in the employ of the Hudson River Railroad Co., did you have opportunities to observe the effect of car-brakes upon the car-wheels—both when the single brakes were used and when the double brakes were used? If yea, please state what your opportunities were.

Ans. I did; it was part of my duty to take out worn wheels and put in new ones.

Int. 8. State the effect of each kind of brake on the wheels?

Ans. When the single brakes were used, the wheels would slide on the track and wear flat places on them; but after the double brake was used, they broke on the wheels more evenly—the wheels did not slide so much, and therefore lasted longer than when the single brakes were used.

Int. 9. How much longer, and what would the saving be?

Ans. With the double brake, the saving would be from two to three sets of wheels a year.

JAMES M. COTTING.

Subscribed and sworn to before me this 5th day of January, A. D. 1872.

E. B. SHERMAN,
Notary Public.

(No cross-examination.)

CHICAGO, *Jan. 24th*, 1872.

1818 HORATIO ANDERSON, being duly called and sworn on behalf of the complainant, testified as follows:

Q. 1. What is your name, age, residence, and occupation?

A. Horatio Anderson; age, forty-seven; residence, Chicago; I am not at present in any business; I have been, until within two years, master mechanic of the Chicago and Northwestern Railroad.

Q. 2. Please state what was your occupation between the month of July, 1859, and the 2d of June, 1864?

A. I was master mechanic of the Chicago and Northwestern Railroad.

Q. 3. Please state whether, during this time, your position as master mechanic required you to know the number of locomotive engines used on trains for the conveyance of passengers on said Chicago and Northwestern Railroad.

A. Yes; it did.

Q. 4. How many such engines were there used during said time?

A. There were ten regular passenger engines at that time, and two more running on mixed passenger and freight trains between Harvard and Rockford—one train each way every day.

Q. 5. How many of these twelve engines were in daily use for the purpose mentioned?

A. All of them. When one of them was laid up a freight-engine had to be taken to be used in its place.

Q. 6. State whether the duties of a master mechanic enabled you to become familiar with what would be the effect upon a locomotive engine of reversing it frequently under headway—for instance,
1819 say half of the time in stopping passenger-trains at stations?

A. They did.

Q. 7. Please state what such effect would be.

A. Damaging the engine in every part more or less. It racks the engine and strains it all through. It would soon tear the engine all to pieces.

Q. 8. Will you please state how much more, in your judgment, if any more, it would cost for the yearly repairs of a locomotive engine which was reversed under headway as often, say, as at two-thirds of the stations on the Chicago and Northwestern Railroad between July, 1859, and June, 1864, as compared with such cost when a locomotive was reversed no oftener than was done on said road after the double-acting brake was in use there?

A. I don't think a thousand dollars a year would cover it. Perhaps fifteen hundred dollars an engine per year would cover it.

Q. 9. Please state whether it is necessary to reverse locomotive engines under headway in stopping passenger trains at stations when the double brake is used on such trains.

A. No; it is not.

Q. 10. Please state to what element in the double brake this capacity to dispense with the reversing of engines to stop trains at stations is due.

A. It is due to the fact that in the double brake the brakes at both ends of the car are connected together and are placed under the control of a single mind, and are operated by that mind at the same instant.

Q. 11. State whether there is any advantage in this respect, and, if any, what advantage in the Hodge brake or the Stevens brake over the Tanner brake.

A. I do not think there is any.

1820 Q. 12. Please state whether you are familiar with the construction and operation of the Tanner, Hodge, and Stevens brakes.

A. I am. I have seen them all in operation.

Q. 13. With which brake, the Tanner or the Stevens, will the car-wheels last the longest in your judgment?

A. I don't know that there would be any difference.

HORATIO ANDERSON.

Subscribed and sworn to before me this 24th day of January, A. D. 1872.

[L. S.] J. HOWLAND THOMPSON,
Notary Public.

(No cross-examination.)

1820½ THOMAS SAYLES
vs.
THE CHICAGO AND NORTHWESTERN RAILWAY Company. } In chancery.

Exhibit No. 9 in supreme court record.

W'M H. BRADLEY, *Clerk.*

1821 Circuit court of the United States, northern district of Illinois.

THOMAS SAYLES
versus
THE CHICAGO AND NORTHWESTERN RAILWAY Company. } In equity.

Defendants' proofs upon final accounting before the master.

1822 [NOTE.—The deposition of M'r Stephen M. Whipple before the master has, by agreement between the respective counsel, been omitted from the herein printed testimony because it is not material to the subject of the accounting in the case. The asterisks which occur in some of the ensuing depositions denote that a few of the questions and answers in such depositions which are not material to the subject of the accounting have, by similar agreement, been also omitted.]

U. S. circuit court, northern district of Illinois.

THOMAS SAYLES
vs.
CHICAGO AND NORTHWESTERN RAILROAD COMPANY. } In chancery.

In pursuance of an order entered in said cause on the 13th day of February, 1865, by which a reference was made to the undersigned, a master in chancery of said court, to take testimony in said cause, I, H. W. Bishop, j'r, master in chancery aforesaid, hereby report that on Wednesday, the 16th day of January, A. D. 1867, and on other days
1823 subsequent thereto, I was attended by Thomas Sayles, the complainant herein, and by H. W. Blodgett, esq., solicitor for the defendant, who produced before me Stephen M. Whipple, N. W. Huntley, Stephen E. Knott, S. J. Hayes, H. Gray, Benjamin Garvin, and Thomas Hull, who, having been by me first duly cautioned and sworn, testified as in their examination hereunto annexed will fully appear; and I further certify that by stipulation between the parties before me it was agreed that the testimony of George M. Dunlap and William A. Ingalls, witnesses also on the part of defendant, should be taken before John T. Reilly and returned by me with the testimony of the other witnesses heretofore mentioned, and that the testimony so taken as last aforesaid should be used as if the same had been actually taken before me under said order.

And I further report that I now return said testimony with the other testimony taken before me as aforesaid.

1824 *Testimony on behalf of the defendants.*

• • • • • •

Testimony of NATHAN W. HUNTLEY, called by defendants:

Q. 1. What is your name, age, and occupation, and where do you now reside?

A. Nathan W. Huntley; I am thirty-seven years of age; I reside in Chicago; I am a mechanic by occupation.

Q. 2. Are you acquainted with the parties to this suit? If yea, how long have you known them respectively?

A. I am; I met M'r Sayles before the present time, five or six years ago, and met him once or twice since that time. I have known the defendants ever since they assumed the name of the Chicago and Northwestern Company.

Q. 3. State what have been your facilities and opportunities for becoming familiar with the subject of mechanics, particularly relating to railroad machinery?

A. It has been my study and practice for fifteen years; I have manufactured and put on myself; I have manufactured almost everything connected with railroad machinery, and under my own supervision have had it manufactured myself.

Q. 4. Have you been connected with railroads in any capacity, and, if so, in what capacity, and how long?

A. I have been connected with railroads for fifteen years;
1825 first as a journeyman, and then as foreman in general car repairs on the road. Then as master carpenter, having charge of all repairs of cars and buildings on the road; then as master mechanic,

having charge of the motive power, as well as car building. I was connected with the Great Western road, of Canada, first; was there a short time; was then connected with what is now the Northwestern road, in Chicago. Then with the Chicago and Milwaukee road. I am not connected with any railroad now; I left the first of last June the service of the Milwaukee road, at the time the Northwestern took control.

Q. 5. Are you familiar with railroad brakes that are now used on railroads, and particularly are you acquainted with the so-called Tanner and Stevens brakes; if yea, how long have you known them?

A. Yes, I am; I know the Tanner and Stevens brakes; I have known them fifteen years.

* * * * * * *

Q. 9. Do you know what brakes are used on the road of the defendant; if yea, what are they?

A. I know the general brake used—the old single brake, and the so-called Stevens double-acting brake, known as the Stevens brake.

Q. 10. In the use of the Stevens brake, what proportion of brakemen does it take to brake all the wheels of a car, in comparison with the old single-acting brake to accomplish the same purpose?

A. One-half the number.

Q. 11. How many brakemen does it take to a car to brake all the wheels by the use of the single-acting brake at the same time?

A. Two; provided the brakes are on both trucks.

Cross-examination by complainant:

Cross-q. 1. How many brakemen would it require to apply the brakes on all the wheels of two cars in a train with the so-called Tanner 1826 brake, as are now practised by railroad companies?

A. It would require two; it is the usual custom for one brakeman to brake two cars, braking from the rear end of one car and the forward end of the other.

Cross-q 2. How many brakemen would be required to apply the brakes to all the wheels of two cars in a train with the single brake—as usually practised I mean?

A. It would require three.

* * * * * * *

Cross-q. 7. Does the Tanner patent apply the brakes to all the wheels of a car simultaneously from either end of the car, by means of the windlasses and connecting rods and levers?

A. It does.

Cross-q. 8. Does the Stevens patent car brake apply the brakes to all the wheels of a car simultaneously from either end of the car by means of the windlasses and connecting rods and levers?

A. With perfect mechanism and construction it would.

* * * * * * *

Cross-q. 10. In your direct examination you have stated certain differences to exist between the construction of the Stevens brake and the Tanner brake; are we to understand that you consider the Stevens brake an improvement on the Tanner brake?

(Objected to.)

A. Well, for the purposes that the two brakes are designed for, it is an improvement on the Tanner brake.

Redirect:

1827 Q. In a train of two cars using the Stevens brake, how many brakemen would it require to simultaneously apply the brakes to all the wheels of the train?

A. It would take two.

Recross:

Cross-q. 11. In a train of two cars using the Stevens brake, how many brakemen would it require to apply the brakes to all the wheels of the train as now generally practiced by railroad companies?

A. One; braking from rear end of one car and the forward end of the other car.

Cross-q. 12. Is it necessary, in your opinion, to apply the brakes to all the wheels in a passenger train of cars, as a general thing, for the safety of the train?

A. In case of danger, it is necessary to apply all the retarding force possible to the speed of the train.

N. W. HUNTLEY.

Subscribed and sworn to before me, and read over before signing, February 23d, 1867.

H. W. BISHOP, J'R,
Master, &c.

Testimony of THOMAS HULL, called by defendants:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Thomas Hull; forty-six years; residence, Chicago; and I am master of the car department of the Chicago and Northwestern Railroad Company, Wisconsin Division.

Q. 2. Are you acquainted with the parties to this suit; if yea, how long have you known them?

A. I am not acquainted with the complainant.

1828 Q. 3. How long have you been in the employ of the Chicago and Northwestern Railway Company?

A. I have been directly connected with the car-department nine or twelve years—nine years certainly.

Q. 4. Do you know what brake was used on the Chicago and Northwestern Railway—the passenger-cars—from June, 1859, to June, 1864? If yea, state what brake was used.

A. I do know; it was the Stevens brake that was used.

Q. 5. Was the brake commonly called the Tanner brake used on this road during this time?

A. Not to my knowledge.

Q. 6. On a train of passenger-cars, to secure the highest degree of safety, how many brakemen does it require?

A. I should put one to every car.

Cross-examination:

Cross-q. 1. Do you consider it necessary to apply the brakes to all the wheels of a passenger-train, when stopping at stations, or in case of obstructions on the track, or in case of accidents to the train, for the safety of the passengers and train?

A. I do.

Cross-q. 2. According to the general practice of railroad companies, how many brakemen would it require to apply all the brakes to six cars in a train while using this Stevens or Tanner brake?

A. Three brakemen.

Cross-q. 3. How many brakemen would it require to apply all the brakes to such a train with the old single brake?

A. Seven brakemen.

THO'S HULL.

Subscribed and sworn to before me March 5, 1867.

H. W. BISHOP, J'R,
Master, &c.

1829 Testimony of SAMUEL J. HAYES, called by defendants.

Q. 1. What is your name, age, and occupation, and where do you now reside?

A. My name is Samuel J. Hayes; I am forty-nine years; I reside in this city; I am a mechanical engineer; I have superintending of the machinery on the Illinois Central Railway—all the machinery on that road.

Q. 2. Are you acquainted with the parties to this suit; if yea, how long have you known them?

A. I am; I have known the officers of the Northwestern road six or eight years; have not been acquainted with M'r Sayles a great while; I have met him a few times.

Q. 3. Are you familiar with the subject of mechanics? If yea, state what have been your facilities for acquiring a knowledge of the subject—particularly relating to railroad machinery.

A. I am—to first question. In 1835 I was an apprentice to Ross Winans, in the city of Baltimore; I served my regular apprenticeship—steam-engine building, locomotive building—under M'r Ross Winans. In 1840 I was transferred from Winans' shop to the company's shop—Baltimore and Ohio Railroad Company's shop—and placed as general foreman over their engines and cars—which situation I filled till 1847. At that time I was placed as general master mechanic over all their machinery. I remained in that position until in 1851, when I took the superintendency of the rolling stock of the whole road. I remained in that till in 1856, when I left and came to Chicago, to take a similar situation with the Illinois Central Railroad, where I remain at present. During that time—from 1847 till the present time—the drawings, plans, designs of the engines and cars have been made under my charge and direction for both of said roads.

1830 Q. 4. Are you acquainted with the so-called Tanner patent car-brake, and the Stevens patent car-brake?

A. I am.

* * * * * * *

Q. 11. Take a train with a given number of eight-wheel coaches as they were made and used when the old single brake was in use, and a train with the same number of eight-wheel coaches using the double-acting brake, was it the custom to use more brakesmen with a single-acting brake than is commonly used with the double-acting brake?

A. There was not any more brakesmen used with the old-fashioned brake than with the double brake on roads I have been connected with, nor have I noticed that there was in my observation in passing over other roads. It has always been the custom to have two brakemen on an ordinary passenger-train, and it is still the custom.

Cross-examination:

Cross-q. 1. Suppose a passenger-train with four cars with the double-acting brakes on said cars, would, in your opinion, two brakemen be more than would be necessary for the safety of that train?

A. No, sir.

Cross-q. 2. How many of the wheels of that train of four cars would the two brakemen apply the brake to with the said double brake?

A. That would depend on the position in which you placed the brakemen.

Cross-q. 3. As brakemen are usually placed on such a train of cars?

A. They would apply the power to the whole 32 wheels—all the wheels on the train.

Cross-q. 4. How many brakemen would it require to apply the brakes to all the wheels of such a train with the old single brake?

1831 A. The same nunber of brakemen could do it by running through the cars—by applying them on one platform and running through to the next, as they used to do.

Cross-q. 5. How many brakemen would it require to apply the brakes to all the wheels of such a train as quick with the single brake as the two brakemen could with the double brake?

A. It would take five.

Cross-q. 6. Do you consider that it would be safe in stopping a train of passenger-cars in case of obstructions being seen on the track by the engineer, and he blowing his whistle for the brakeman to apply the brakes, to depend on brakemen applying the brake at one end of the cars and then running through the car to apply it to the other end with the single brake?

A. If the obstruction was permanent, I should consider it unsafe.

Cross-q. 7. Is it not often the case that from obstructions being seen on the track, or other cause, that it is necessary for the safety of the train and passengers therein that the train should be stopped in going the shortest possible distance?

A. It is.

Cross-q. 8. In that case do you consider it would be safe to depend on the brakemen running through the cars on the train, first applying the brake on one end of the car and then the other—as he would have to do with the single brake?

A. Being schooled as we are now to the use of the double brake, we would not consider it so, but we did consider it so at one time in the history of railroading; that was the custom.

Cross-q. 9. State how long ago.

A. Well, 18 or 20 years ago.

Cross-q. 10. There were no double brakes in use 18 or 20 years ago, were there?

A. Not in general use, I believe; might have been some few in use.

1832 Cross-q. 11. State whether you knew of any at that time—double-acting brakes?

A. I think I have seen some few of them in use 20 years ago.

Cross-q. 12. On what road did you see them in use 20 years ago?

A. I think I seen them in use upon some tenders on the Baltimore and Ohio road; and, also, on some tenders and cars, I think, on the Baltimore and Susquehanna road.

Cross-q. 13. Are there double-acting brakes in general use on the different railroads in this country?

A. There are upon passenger-trains; not in general use on freight-trains.

Cross-q. 14. Do you know of any railroad—any prominent railroad—in this country where the single-acting brake is in general use on their passenger-trains ?

A. I do not.

Cross-q. 15. According to the general practice of applying the double-acting brake to passenger-trains, how would the number of brakemen in applying the brake to such trains with the single-acting brake compare ?

A. It would take double the number with an odd number of cars to apply the brakes in the same time.

Cross-q. 16. An even number of cars in a train ?

A. With an even number, it would take one more than double the number for each train.

* * * * * *

Cross-examination resumed by M'r Sayles:

Cross-q. 19. Would you consider it safe now (considering the improvements that have been made in railroad machinery, and especially in
car brakes, during the last 20 years) to run passenger-trains, as
1833 generally they are now run, with the same number of brakemen
that were engaged on passenger-trains 20 years ago with the
single brake ?

A. I should not, with our present knowledge of railroad machinery.

Cross-q. 20. Were passenger-trains 20 years ago run at the same rate of speed as they are now ?

A. I think not; in this country the speed is greater now than it was twenty years ago.

Cross-q. 21. Is it, or is it not, necessary when a train is run at a high rate of speed, to have more brakemen on a train, as a general thing, than when run at a low rate of speed ?

A. Yes, it is; considering the same number of cars on the train.

S. J. HAYES.

Subscribed March 14, 1867, before me.

H. W. BISHOP, J'r,
Master, &c.

Testimony of **Benjamin Garvin**, called by defendants.

Q. 1. State you' name, age, occupation, and residence.

A. My name is Benjamin Garvin; my age, 43; my residence, Fond du Lac, Wisconsin; and my occupation is foreman of the shop for the repairs of engines at Oshkosh.

Q. 2. How long have you been connected with railroads, what roads have you been connected with, and in what capacity ?

A. I have been connected with railroads for twenty-four years; the Concord and Nashua, Northern New Hampshire, Vermont Central, and the Chicago and Northwestern Railroads, as locomotive-engineer and foreman of shop.

1834 Q. 3. Have the roads that you have been connected with used the single and double-acting brake ?

A. They have.

Q. 4. Take a train with a given number of eight-wheeled coaches in, as they were made and used when the old single brake was in use, and a train with the same number of eight-wheeled coaches, using the double-acting brake, was it the custom to use more brakemen with the single-acting brake than is used with the double-acting brake?

A. It was not.

Q. 5. Were accidents upon passenger-trains caused by the brakes giving way, or getting out of repair, any more frequent in the use of the old single brake than they are now in the use of the double-acting brake?

A. I don't think they were; brakes are generally better taken care of when they are single than when they are double; if a double brake is not kept well adjusted, it don't amount to much—don't amount to any more than a single brake.

Cross-examination:

Cross q. 1. What double brakes have you referred to in your last answer?

A. Either—any double brake.

Cross-q. 2. Hodges', Stevens', and Tanners'—are you acquainted with all of them?

A. I have seen them all used.

Cross q. 3. Why were the double brakes not as well taken care of as the single brakes?

(Objected to.)

A. They depended too much on the double brake, because they had a double brake.

Cross-q. 4. Is the double brake, then, generally considered much safer and better than the single brake on passenger-trains?

A. I never considered it any safer or any better.

1835 Cross-q. 5. I don't ask you what you consider—I ask you generally.

A. I am not conversant with adjusting brakes, but I know when it works well and is taken care of.

Cross-q. 6. How long since you have known the single brake to be in general use on any railroad, and what railroad?

A. I think it has been about fourteen years since the single brake has been used on passenger-cars.

Cross-q. 7. On what road do you know it to be used fourteen years ago?

A. I think we used them on the Vermont Central and the Northern New Hampshire. I think they were using both single and double at that time.

Cross-q. 8. Did passenger-trains run at the same rate of speed then that they do now?

A. They run faster when they used the T rail.

Cross-q. 9. Is the double-acting brake in general use on the railroad that you are connected with now?

A. They are; on passenger-cars.

Cross-q. 10. How long have you been connected with the Northwestern Railroad?

A. Thirteen years this spring, I think.

Cross-q. 11. During the last six or eight years, do you think that company has employed more brakemen on their passenger-cars than has been necessary for the safety of their trains and passengers?

(Objected to.)

A. I think they could have got along with less, and done it just as safe—that is, in some cases, perhaps—as a general thing they need them all.

BENJAMIN GARVIN.

Subscribed before me this 19th day of March, A. D. 1867.

H. W. BISHOP, J'R,
Master, &c.

1836 **APRIL 3D, 1867.**

Testimony of GEO. L. DUNLAP, called by defendants:

Q. 1. What is your name, age, and occupation?

A. Geo. L. Dunlap; sup't Chicago & Northwestern Railroad; 38 years of age October, 1866.

Q. 2. Are you acquainted with the general practice of managing railroads?

A. I am.

Q. 5. How long have you been engaged or connected with railroads, and what have been your relations? State fully.

A. For 19 years continually. First, on Boston & Maine road, in general superintendent's office; on N. Y. & E., general ticket agent; then on C. & N. W. as superintendent.

Q. 4. Are you acquainted with the brakes that were used on these various roads?

A. I am.

Q. 5. How long has the double-acting brake been in use?

A. More or less since 1850—not generally till then.

Q. 6. What other brakes were used besides the double-acting?

A. The single brake.

Q. 7. As it has been generally the practice, did or did it not require more brakemen to run a train of cars with a given number of coaches using the single than when using the double-acting brake?

A. The general practice was they used more brakemen then than now.

Q. 8. Were or were not the trains as safely run when the single brake was used as when the double-acting brake was used?

A. So far as the general agency of the brakes is concerned, I don't think it makes much difference; so far as accidents are concerned, it is no matter what kind of brakes is used; about so many accidents will occur.

1837 Q. 9. In the usual running of trains, was it the practice to stop them as quickly while using the single brake as it is when using the double-acting brake?

A. I should say it was.

Q. 10. What brake is used on the Chicago & Northwestern?

A. Stevens brake—on passenger trains.

Q. 11. In the use of the single brake, did the car wheels wear a longer time or less time than in the use of the double-acting brake?

A. I can't recollect about that.

Cross-examination:

Cross-q. 1. Is the double-acting brake in general use on the railroads of this country?

A. It is.

Cross-q. 2. Were you superintendent of the Chicago & Northwestern Railroad from June, 1859, to June, 1864?

A. I was.

Cross-q. 3. Did you employ more brakemen on the passenger trains during that period than you considered necessary for the safety of the trains and passengers?

A. I did not.

GEO. L. DUNLAP.

Subscribed before me this 3d day of April, 1867.

H. W. BISHOP, J'R,
Master, &c.

1838 **DEFENDANTS' PROOFS.**

Reported by J. M. W. Yerrington.

The following witnesses were duly sworn and their depositions taken, at Springfield, Mass., July 31, August 2, 3, 5, 1872:

Deposition of William H. Russell.

Direct examination by S. M. Whipple:

Int. 1. What is your name, age, residence, and occupation?

A. My name is William H. Russell; age, 53; residence, Springfield; occupation, road-master and wood agent of the Boston and Albany Railroad.

Int. 2. Please state the mountain range across which the Boston and Albany road runs between Springfield and Albany.

A. What is called the Green Mountain range.

Int. 3. What are the grades on the eastern slope?

A. The heaviest east grade is 85 feet.

Int. 4. What are the grades on the western slope, towards Pittsfield?

A. Seventy-five feet.

Int. 5. What are the grades on the line between Springfield and Boston?

A. Sixty feet is the heaviest.

Int. 6. Please state the number of feet of the different stations, or most of them, above tide-water.

A. Framingham, 162 feet; Worcester, 473 feet; Worcester Junction,
473 feet; Charlton, 898 feet; Brimfield, 604 feet; Palmer, 334
1839 feet; Springfield, 69 feet; Westfield, 149 feet; Chester, 602 feet;
Middlefield, 979 feet; Washington, 1,494 feet; Pittsfield, 1,069
feet; State line, 954 feet; Canaan, 867 feet; Chatham, 460 feet; Chatham
Centre, 305 feet; Greenbush, 25 feet.

Int. 7. Please state the radius of some of the sharpest curves on your entire line.

A. Well, between here and Pittsfield our sharpest is 764 feet; between Pittsfield and Albany, 818 feet; east of Springfield, 1,432 feet.

Int. 8. How many stations are located on curves on your line of road between Springfield and Albany?

A. Twenty-four: Cottage Farm, Brighton, Auburndale, Riverside, Rice Flag station, Grantville, Wellesley, Westborough, Rochdale, Warren, West Warren, Brimfield flag station, Huntington, Chester, Middlefield, Becket, Hinsdale, Richmond, State line, Canaan, East Chatham, Chatham Centre, Kinderhook, Scodack.

Int. 9. Are all these stations you have mentioned on curves?

A. Yes, sir.

Int. 10. How sharp are these curves?

A. There is only one that is over 2,865 feet; that is at East Chatham. That is 1,432 feet. That is the shortest radius.

Int. 11. About what are the others?

A. Probably they would not average more than 4,000 feet. They are on slight curves, most of them.

Int. 12. The curves are anywhere between those two extremes?

A. Well, I say the shortest is four degrees; that is, 1,432 feet. The other stations would not average much more than a degree and a half; that is, 4,000 feet. They are all slight curves.

WILLIAM H. RUSSELL.

Deposition of F. D. Adams, taken at Springfield, Mass., July 31, 1872.

Direct examination by S. M. Whipple:

Int. 1. What is your name, age, residence, and occupation?

1840 A. My name is F. D. Adams; age, 50; residence, Springfield; occupation, car-builder.

Int. 2. For what railroad company?

A. The Boston and Albany.

Int. 3. Have you acted in the capacity of car-builder for any other company? and, if so, please state for what company.

A. I have been in the employ of the Buffalo and Erie road for about ten years, in charge of the car department; I have also been in charge of private car shops for some ten years.

Int. 4. How many years altogether have you been connected with car building?

A. About twenty-five or twenty-six years, about twenty of which I have been in charge of the work.

Int. 5. Do you build passenger cars at the Springfield shops of the Boston and Albany Railroad?

A. We do.

Int. 6. When were cars No. 123 and No. 124 finished and put to service?

A. No. 123 was built in October, 1871, and No. 124 in November, 1871; and No. 123 was put immediately on the track and went to running in October, and No. 124 commenced running in the early part of December.

Int. 7. What is the weight of cars No. 123 and No. 124?

A. The whole entire car, running gear and all, about twenty-two tons and a half.

Int. 8. What kind of wheels was applied to those cars when they were new?

A. We use a steel-tired wheel altogether on all of our passenger cars. We use four-wheel trucks mainly. There are four-wheel trucks under those two cars you speak of.

Int. 9. Are the cars still running on the road, with the same wheels, or steel-tired wheels?

A. Yes, sir.

Int. 10. At what time were cars No. 123 and No. 124 put into regular service in the train?

A. Well, they were put to running together about December 8, I think. They had run a little before that. No. 123 had run a little before;

1841 but I think the first service done by No. 124 was in this case where they were put in the same train together. It had made perhaps one or two trips out on the road.

Int. 11. At the time No. 123 was put to service in the train, what kind of brake was applied to it, when the two were put together?

A. At the time they were put together, No. 123 had the Tanner brake, I think.

Int. 12. Please look at "Defendants' Exhibit, large Tanner brake, 123," and state whether it correctly represents the size of levers, the proportion of levers, the size of windlass wheel, and the size of shaft on which the chain winds, put upon said car No. 123.

A. I should think they were about the same proportion. The fulcrums were 6 inches, and the long arm on the truck levers was 27 inches. The levers are arranged in the same manner. The wheel was 16 inches in diameter. That is the same size wheel we use—a 16-inch wheel. The shaft on which the chain winds is an inch and a half. That is the same size.

Int. 13. Then, in all respects it is the same as was applied to car No. 123?

A. I should think it was. It is applied in the same manner, and has the same length of levers.

Int. 14. What is the extreme length of the centre-lever?

A. Four feet. That is a fac-simile of what was used on No. 123, both in style and proportion.

Int. 15. Please look at the shoes lying about the exhibit, and state whether they are the shoes used by your road on that car; and state the weight.

A. It is the same pattern of shoe. The weight is 29 pounds.

Int. 16. What is the weight of iron applied to the whole car?

A. The weight of shoes applied to the whole car is 232 pounds.

Int. 17. Now look at "Defendants' Exhibit, large Springfield brake, 124," and state whether it is a correct representation of the brake, as applied to car No. 124, when it was put to service in the train.

1842 A. I should think it was put up in the same manner.

Int. 18. Are the levers the same proportion as in No. 123?

A. I think they are, from appearance. The long arm was about 27 inches, and the short arm 6; and the wheel was the same size we use on all our cars—16-inch wheel; and the "twister," the base of the windlass shaft, was an inch and a half. The "twister" we call it, most generally.

Int. 19. Please state whether or not the levers were placed, as represented, upon the outside of the brake-bars.

A. They were.

Int. 20. And also upon the outside, as seen in "Exhibit, large Tanner brake, 123?"

A. Yes, sir.

Int. 21. Then, if I understand you, the levers and the proportion of the levers are the same in "Exhibit, large Springfield brake, 124," and "Exhibit, large Tanner brake, 123?"

A. Just the same.

Int. 22. Can you prove it by the scales?

A. I presume so. I see the scales are attached there.

Int. 23. Please wind up the 16-inch windlass upon the "Defendants' Exhibit, large Tanner Brake, 123," until the scales indicate 48 pounds on each truck, and put down the dog in the rachet on the windlass wheel. (The witness did as requested.) Now you will please take "Exhibit, round scale," and apply it to the periphery of the wheel, and state how many pounds it takes to relieve the dog from the ratchet.

A. Just two pounds to throw the dog out. They are just alike.

Int. 24. Will you state the number of pounds pressure indicated by the scales in each truck when you begin to wind up the windlass as it stands?

A. Well, that is 16 pounds.

A. Probably they would not average more than 4,000 feet. They are on slight curves, most of them.

Int. 12. The curves are anywhere between those two extremes?

A. Well, I say the shortest is four degrees; that is, 1,432 feet. The other stations would not average much more than a degree and a half; that is, 4,000 feet. They are all slight curves.

WILLIAM H. RUSSELL.

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Direct examination by S. M. Whipple:

Int. 1. What is your name, age, residence, and occupation?

1840 A. My name is F. D. Adams; age, 50; residence, Springfield; occupation, car-builder.

Int. 2. For what railroad company?

A. The Boston and Albany.

Int. 3. Have you acted in the capacity of car-builder for any other company? and, if so, please state for what company.

A. I have been in the employ of the Buffalo and Erie road for about ten years, in charge of the car department; I have also been in charge of private car shops for some ten years.

Int. 4. How many years altogether have you been connected with car building?

A. About twenty-five or twenty-six years, about twenty of which I have been in charge of the work.

Int. 5. Do you build passenger cars at the Springfield shops of the Boston and Albany Railroad?

A. We do.

Int. 6. When were cars No. 123 and No. 124 finished and put to service?

A. No. 123 was built in October, 1871, and No. 124 in November, 1871; and No. 123 was put immediately on the track and went to running in October, and No. 124 commenced running in the early part of December.

Int. 7. What is the weight of cars No. 123 and No. 124?

A. The whole entire car, running gear and all, about twenty-two tons and a half.

Int. 8. What kind of wheels was applied to those cars when they were new?

A. We use a steel-tired wheel altogether on all of our passenger cars. We use four-wheel trucks mainly. There are four-wheel trucks under those two cars you speak of.

Int. 9. Are the cars still running on the road, with the same wheels, or steel-tired wheels?

A. Yes, sir.

Int. 10. At what time were cars No. 123 and No. 124 put into regular service in the train?

A. Well, they were put to running together about December 8, I think. They had run a little before that. No. 123 had run a little before;
1841 but I think the first service done by No. 124 was in this case where they were put in the same train together. It had made perhaps one or two trips out on the road.

Int. 11. At the time No. 123 was put to service in the train, what kind of brake was applied to it, when the two were put together?

A. At the time they were put together, No. 123 had the Tanner brake, I think.

Int. 12. Please look at "Defendants' Exhibit, large Tanner brake, 123," and state whether it correctly represents the size of levers, the proportion of levers, the size of windlass wheel, and the size of shaft on which the chain winds, put upon said car No. 123.

A. I should think they were about the same proportion. The fulcrums were 6 inches, and the long arm on the truck levers was 27 inches. The levers are arranged in the same manner. The wheel was 16 inches in diameter. That is the same size wheel we use—a 16-inch wheel. The shaft on which the chain winds is an inch and a half. That is the same size.

Int. 13. Then, in all respects it is the same as was applied to car No. 123?

A. I should think it was. It is applied in the same manner, and has the same length of levers.

Int. 14. What is the extreme length of the centre-lever?

A. Four feet. That is a fac-simile of what was used on No. 123, both in style and proportion.

Int. 15. Please look at the shoes lying about the exhibit, and state whether they are the shoes used by your road on that car; and state the weight.

A. It is the same pattern of shoe. The weight is 29 pounds.

Int. 16. What is the weight of iron applied to the whole car?

A. The weight of shoes applied to the whole car is 232 pounds.

Int. 17. Now look at "Defendants' Exhibit, large Springfield brake, 124," and state whether it is a correct representation of the brake, as applied to car No. 124, when it was put to service in the train.

1842 A. I should think it was put up in the same manner.

Int. 18. Are the levers the same proportion as in No. 123?

A. I think they are, from appearance. The long arm was about 27 inches, and the short arm 6; and the wheel was the same size we use on all our cars—16-inch wheel; and the "twister," the base of the windlass shaft, was an inch and a half. The "twister" we call it, most generally.

Int. 19. Please state whether or not the levers were placed, as represented, upon the outside of the brake-bars.

A. They were.

Int. 20. And also upon the outside, as seen in "Exhibit, large Tanner brake, 123?"

A. Yes, sir.

Int. 21. Then, if I understand you, the levers and the proportion of the levers are the same in "Exhibit, large Springfield brake, 124," and "Exhibit, large Tanner brake, 123?"

A. Just the same.

Int. 22. Can you prove it by the scales?

A. I presume so. I see the scales are attached there.

Int. 23. Please wind up the 16-inch windlass upon the "Defendants' Exhibit, large Tanner Brake, 123," until the scales indicate 48 pounds on each truck, and put down the dog in the rachet on the windlass wheel. (The witness did as requested.) Now you will please take "Exhibit, round scale," and apply it to the periphery of the wheel, and state how many pounds it takes to relieve the dog from the ratchet.

A. Just two pounds to throw the dog out. They are just alike.

Int. 24. Will you state the number of pounds pressure indicated by the scales in each truck when you begin to wind up the windlass as it stands?

A. Well, that is 16 pounds.

Int. 25. Is it 16 pounds in each truck?

A. Yes, sir; it stands at 16 pounds.

Int. 26. When you wound up the windlass to 48 pounds or thereabouts, did it indicate the same pressure in each truck?

1843 A. It did.

Int. 27. You will now please look at "Defendants' Exhibit, large Springfield brake, 124," and state what the scales indicate.

A. That stands at 16 pounds; as near that as you can say; and this is the same. They both stand at 16.

Int. 28. The scales in each truck indicate the same?

A. Yes, sir; the same pressure.

Int. 29. You will now please wind up the 16-inch-diameter windlass until the scales in each truck indicate 48 pounds, and put down the dog in the ratchet. (Witness complied with the request.) Do the scales indicate 48 pounds in each truck?

A. Yes, sir.

Int. 30. You will please now apply "Exhibit, round scale," to the periphery of the 16-inch wheel, and state how many pounds it takes to relieve the dog from the ratchet.

A. Well, it is two pounds, as near as you can get it. Two pounds lets it off.

Int. 31. From these data, what is the ratio of the power applied to the brake-wheel to the power conveyed to the brakes of each truck?

A. As one is to 24; as one pound of power on the brake-wheel will carry 24 pounds on to each truck.

Int. 32. Can you say the same of "Defendants' Exhibit, large Tanner brake, 123"?

A. Yes, sir; the same; they are just equal.

Int. 33. It would seem from the foregoing, that all the conditions for applying friction force to the wheels of car No. 123 and car No. 124 are the same. Is that so?

A. Yes.

Int. 34. Were these cars coupled together and run over the same road, making the same stops under the brakes?

A. Yes; they were.

Int. 35. State whether, in your judgment, the two brakes ought to consume the same, or about the same, amount of iron to do the same work.

A. I should think they would, with the same power applied.

1844 Int. 36. Into whose train were these cars put?

A. They were put into Conductor Clark's train.

Int. 37. Where run?

A. From Springfield to Boston and return.

Int. 38. How often?

A. The round trip every day.

Int. 39. How many stops did "Defendants' Exhibit, Tanner brake, 123," make, as reported to you by M'r Clark, the conductor?

A. No. 123 made 1,521 stops—47 stops a day.

Int. 40. How much iron was consumed to make that number of stops?

A. 76 pounds.

(Plaintiff objected to this and the previous answer as hearsay.)

Int. 41. Who was instructed to keep account of the weight of iron consumed by the different brakes?

A. M'r Benjamin Ray, our inspector in Boston.

Int. 42. What number of pounds did he report to you were consumed in making 1,521 stops?

A. He reported to me, also, that they consumed 76 pounds on No. 123.

(Plaintiff objected to the answer as hearsay.)

Int. 43. Have the shoes worn out on each car been preserved?

A. They have.

Int. 44. By whom?

A. By M'r Ray; and sent to me.

Int. 45. Can they be produced?

A. Yes, sir; they are here.

Int. 46. Where are the shoes worn out on M'r Clark's train, on car No. 123?

A. Those are the shoes, piled up on the box.

Int. 47. You will please now look at "Defendants' Exhibit, large Springfield brake," and state how many stops were made by it in M'r Clark's train.

1845 A. No. 124 was reported to have made 1,479 stops.

Int. 48. And how much iron was it reported to you that the brake consumed, in making that number of stops?

A. That car consumed 77 pounds of iron.

Int. 49. And how many stops a day?

A. Thirty-four. I have stated that these cars were run together. As it stands now it looks an utter impossibility for one car to make more stops than another if they were kept coupled together all the time. My trouble was, that my testimony would look a little mixed here, making the statement that one car made more stops than the other, and yet, at the same time, making the statement that they were coupled together all the time.

Int. 50. Will you please explain that matter, as you understand it?

A. The reason why one, No. 123, was required to make more stops than the other was, it was run in an accommodation train from Boston to Worcester, and made all the stops; whereas in coming back from Boston to Worcester No. 124 was run in an express train, and only made part of the stops. They went down coupled together, and came back in separate trains, from Boston to Worcester; the one running as accommodation, the other as express; then they were again coupled together, coming to Springfield.

Int. 51. This experiment being completed, what was further judged best to do in the way of determining the actual capacity of these brakes to control their respective cars, in stopping the trains in which they were run?

A. Well, in order to ascertain precisely, and without any question as to their capacity or power of wear, we thought it best to get out some shoes that were all melted in the same cupola at the same time, the same puddle of iron, in order to have the iron all of the same density, all equal. We had some heads made for each car, and they were put on, by my order, to 123 and 124.

Int. 52. Why was it thought best to have the shoes for each car cast from the same cupola, or puddle of metal?

A. There was a possibility that this iron might not be all of the
1846 same hardness, the same density. We all of us understand per-
fectly well that iron varies in its density, and soft iron would
wear faster than hard iron would; and in order to make the thing per-
fectly sure, so that the iron would be equal in hardness, we were par-
ticular to get two sets of shoes out of the same lot of iron.

Int. 53. Into what train were those cars then put, for a second experiment?

A. They were put into M'r Jennings' train.

Int. 54. And from what place did they start, and to what point did they run?

A. They ran over the whole line of the road, from Boston to Albany.

Int. 55. When did the same train return?

A. The next day. It went up one day and down the next.

Int. 56. Who were the conductors on the train?

A. M'r Jennings, from Boston to Springfield; and M'r John B. Adams, from Springfield to Albany.

Int. 57. And who on the return?

A. On the return, M'r Charles Marsh, from Albany to Springfield; and M'r Jennings, from Springfield to Boston.

Int. 58. How long were the cars run in that train before the shoes were worn out?

A. No. 124 ran from January 30th to March 27th; No. 123, from January 30th to March 25; No. 124 having been taken out of the train, for some cause, two days. I can't call to mind now precisely what called it out; but it was out under some repairs; something was to be done to it that held it two days, and it was not run for that time; consequently, it was run two days more, to make the wear of the shoes and the number of trips equal.

Int. 59. At that time, was it judged proper to renew the iron?

A. Yes, sir; then M'r Ray had the heads renewed, or considered them worn out.

Int. 60. What report did you receive from M'r Ray, as to the weight of iron consumed in the time specified?

A. On No. 124, the weight of iron consumed was 81 pounds; on No. 123, it was 80 pounds.

1847 Int. 61. What was the weight of each shoe at the time of application?

A. The same as before stated, 29 pounds.

Int. 62. And the whole amount on each car?

A. 232 pounds. The shoes were cast from the same pattern, all of them.

Int. 63. That each car might take the grades alike, east and west, how was the train made up at Boston?

A. Well, it was thought best, and reported to me to have been done, to so arrange the cars in the train that one would go behind one day, and the other the next.

Int. 64. That is, No. 123 would go in the rear of the train one trip?

A. Yes, sir; and No. 124 the next trip, in order to give perfect equality in the wear of the brakes. It was thought there might be some inequality in the grades, thus giving one an advantage over the other. To obviate that, we thought it best to have them changed; and every time the train went to Boston, they were reversed.

Int. 65. After the completion of this second experiment, what disposal was made of the Tanner brake, on car No. 123?

A. After those shoes had been worn out, we took the Tanner brake off and put the old Springfield brake on No. 123; in other words, made it the same as No. 124.

Int. 66. In making the change to the old Springfield brake, what parts were retained for further use in car No. 123, and what parts discarded?

A. Well, we discarded the centre lever, and used the same truc levers and the same brake shaft. Everything was used except the centre lever.

Int. 67. Discarding the centre lever, what additions were made, in order to complete the Springfield brake ?

A. Nothing, except connecting the levers with the "twister," and adding two more levers. We used the same levers and added two more, and discarded the centre lever.

Int. 68. The two added were the same as those seen in "Defendants' Exhibit, old Springfield brakes," connected directly with the windlass ?

1848 A. Yes, sir, the same as the others.

Int. 69. The brake having been changed on car No. 123 from the Tanner brake to the old Springfield brake, what was it judged best to do to further test the capacity of the old Springfield brake ?

A. We put the old Springfield brake under the whole train, which consisted of three additional cars besides these two—five cars.

Int. 70. And where did you continue to run the train ?

A. We run the same train that had run previously from Boston to Albany, and has run ever since.

Int. 71. And is run at the present time ?

A. And is run at the present time in the same manner.

Int. 72. I think you have stated that this train leaves Boston every other day for Albany ?

A. Yes.

Int. 73. What train is run in connection with it on alternate days, and what brakes are applied to it ?

A. I don't know as I can give the numbers of the cars precisely. There is a train that corresponds to this that runs on opposite days, the cars of which are fitted up with the Hodge brake.

Int. 74. And run by the same conductors ?

A. Yes, sir; and by the same engineers, and manned by the same crew of brakemen.

Int. 75. Please state, if you know, how many sets of shoes have been worn out on No. 123 and No. 124 since the old Springfield brake was applied to all the cars of the train ?

A. This is report, too. I don't, of course, put on the shoes myself. It is reported by M'r Ray that two sets of shoes have been worn out, and we are on the third set, since the set that has been referred to was taken off, and the whole train fitted up with the Springfield brakes.

Int. 76. What time was the second set of shoes taken off ?

A. They were put on January 30th, and taken off of No. 124 March 27th, and from No. 123 March 25th.

Int. 77. Previous to that time, the whole train had been equipped with the old Springfield brakes ?

1849 A. No. The two sets of shoes of which the weights have been given were worn out before we put the old Springfield brakes on the whole. After these sets of shoes were worn out, we immediately fitted up the train.

Int. 78. You have worn out two sets since March 27th, and are on the third ?

A. Yes, sir.

Int. 79. After the brake on No. 123 was changed from the Tanner brake to the old Springfield brake, how much iron was consumed on said car and by said brake before it came to shoeing again, as reported to you by M'r Ray, the inspector of cars at Boston ?

A. I have no report of that, I think.

Int. 80. Has any accident happened to the train since it depended entirely on this brake to stop it, to your knowledge?

A. No; there has not.

Int. 81. No complaint has been made to you of the chains overlapping each other when the brake is applied?

A. I never have heard any complaint in relation to it. I might modify that perhaps a little. I have frequently inquired of the brakemen, on the passage through the depot here, how the brakes were working; and I think, in one instance, one of the brakemen said that the brake on No. 123 did not take hold well, or didn't work well; and I gave him directions to call the attention of the inspector at Albany—he was going west—to it, and have it taken up a little; the brake was a little slack. I presume he did so, for the next day he told me it was working well. That was the only instance in which I have ever heard any complaint in relation to it, that I recollect of. There has never been any complaint brought to me; that is, nobody has taken any pains to make any complaint. This was on account of my questioning him.

Int. 82. There has been no complaint about the old Springfield brake not holding as well on a curve as on a straight track, or vice versa?

A. I never have heard any.

1850 Int. 83. Please look at "Defendants' Exhibit, large Tanner brake, 123," and state by what means the power is divided and equalized between the brakes.

A. It is done by the centre lever.

Int. 84. Please now look at "Defendants' Exhibit, large Springfield brake," and answer the same question?

A. That is done through the brake shaft—done by the connecting rods.

Int. 85. By what means is this equality to be preserved, from time to time, as the brake-shoes wear away in Exhibit No. 123?

A. By taking up the lower connection.

Int. 86. And how is it in No. 124?

A. In the same way.

Int. 87. On how many bars do you have to take the wear up in No. 123, and how many in No. 124?

A. You have to take up on the same number in each. You have to take up two rods on No. 124, and only one rod on No. 123. You might say you have to take up on one bar on one, and two bars on the other.

Int. 88. Is it necessary on both brakes that the wear of the shoes should be taken up uniformly?

A. Yes, sir, certainly.

Int. 89. Why should it be taken up uniformly?

A. In order to convey the power uniformly between the two brakes.

Int. 90. What applies to one applies to the other, so far as taking up the wear of the shoes is concerned?

A. Yes, sir, certainly. (Plaintiff objected to the question as leading.) It is certainly very clear to any one who will look at the thing, or knows anything about it. It matters very little which way the question is put.

Int. 91. In applying either of these brakes (I refer to "Defendants' Exhibit, large Tanner brake, 123," and "Defendants' Exhibit, old Springfield brake, 124"), does it or not in any way change the character of the brake, if the truck-levers are put inside the bars instead of outside, the same as seen in both exhibits?

A. No, I think not.

1851 Int. 92. Does it or not change the character of either brake, if the levers are put upon the brake-bars in the manner seen in "Defendants' Exhibit, Springfield tender brake?"

A. No, it does not. The power is applied in the same way. The amount of power is just the same. It does not alter the character of the brake. It does not change the amount of power applied, that I can see.

Int. 93. Does it or not change the character of either brake if the levers are put upon the brake-bars in the manner seen in "Defendants' Exhibit, old single brake?"

A. No. I don't see that it would make any difference whether the fulcrum was made in the bar or in the lever. You can put the lever inside or out in that, and it would not change the relation at all.

Int. 94. Please look at "Defendants' Exhibit, old Springfield brake, 124," and state whether or not it changes the character of the brake to unite the levers in each truck with each other and with the windlass of the car by one chain instead of two, the same as seen in "Defendants' Exhibit, old Springfield tender brake."

A. No; I don't see as that changes its character at all. You get the same power from it on both trucks with one chain that you do with two, precisely. The amount is just the same.

Int. 95. What must be done to this Springfield tender brake to make it operative as a car brake from either end of the car?

(Plaintiff objected to the question.)

A. Put another lever into each truck, and connect them with a windlass at the other end, would make it operative as a car brake.

Int. 96. You will now please look at "Defendants' Exhibit, large Tanner brake, 123," and detach one truck-lever from the centre lever, and then wind up the smaller windlass wheel until the scales in the trucks indicate 48 pounds, and then apply "Exhibit, round scale," to the periphery of the smaller brake-wheel, and state how many pounds it takes to lift the dog from the ratchet, it having been put down when the scale indicates 48 pounds.

1852 A. Well, it is just a hair short of two pounds.

Int. 97. From these data, state whether the smaller, or 12-inch brake-wheel, will apply any more power to one truck than the 16-inch wheel to both trucks.

A. I don't see any difference. The scales show that it is the same.

Int. 98. Which, in your judgement, would produce the most sliding wheels, under the circumstances named, the single truck brake, with the smaller windlass, or the double truck brake, with the larger windlass?

A. I don't think there would be any difference. If the single brakes were fitted with a 12-inch wheel and the double brake with a 16-inch wheel, they would be perfectly equal; the eight wheels would slide as quick as the four wheels. Of course, that is presuming that the brakes are in good order all round.

Int. 99. Which brake, in your judgment, would have the greatest retarding power, to stop a car in motion, 500 pounds communicated to the wheels through a windlass on one truck, or the same number of pounds spread over two trucks, making 250 pounds in each truck?

A. I don't think there would be any difference.

Int. 100. What is your reason for this conclusion?

A. Well, the momentum of the train is stopped by the power applied to the car, whether it is at one point or eight points, or four points or eight points.

Int. 101. Then it makes no difference whether you apply the power to four wheels or eight wheels, so long as they continue to roll on the rail?

A. No; it don't make a particle of difference, in my opinion.

Int. 102. What, then, is the advantage of a double brake over a single brake?

A. So far as retarding or stopping the train is concerned, with the same power used, it would not make any difference, provided you don't slide the wheels. If you put the same power on the one that you do on the two, and no more, and the wheels do not slide, why, there is no difference in them at all, that I can see.

1853 Int. 103. On the journals of car wheels, do you deem it according to the weight of the car, or according to the surface of the bearing of the journals, that friction is developed?

A. Well, we suppose that the friction caused on the journals is according to the amount of weight carried. There is no more friction on a long journal than there would be on a short one, with the same weight. Nothing is added to its friction by spreading it over more surface, beyond what it has on a less surface, with the same weight.

Int. 104. Does the same rule apply to the application of power to the wheels, through the brakes, to generate friction?

A. I should think it did.

Int. 105. To what extent is the Tanner brake now used, so far as your observation and knowledge extend?

A. Well, I have not seen the Tanner brake used, in my travels, anywhere for a good many years, except where I have put it on here.

Int. 106. To what extent are you acquainted with the use of brakes in the United States?

A. Well, I have put on all these different kinds of brakes that are in general use; this single brake, the Stevens brake, the Hodge brake, the Tanner brake.

Int. 107. Please state what brake has superseded the Tanner brake.

Q. I think the Hodge brake has come into general use throughout the country. It is the one most generally used.

Int. 108. What other brake is in quite general use in different parts of the country?

A. Well, the Stevens brake is used; I don't know but possibly it may be used as much as the Hodge brake, but I think not.

Int. 109. What is the weight of the train of cars on which the old Springfield brake is used, including the weight of engine, tender, passengers, and baggage?

A. I should put it about one hundred and fifty tons, the five cars, engine and tender. Of course we have got to approximate it.

1854 Int. 110. Which brake, in your judgment, is the best, the old Springfield brake, the Tanner brake, or the Hodge brake? Whatever your answer may be, please give the reason.

A. Well, the Hodge brake is the best brake, unquestionably. The reason of it is, it equalizes better, and requires less attention to keep it in good working order than either of the others.

Int. 111. Wherein does the application of the Hodge brake on the cars on your road differ from the application of the Springfield brake in the matter of size of shaft on which the chain is wound, length of levers in the trucks, and the hanging of the brakes to the wheels?

A. It differs materially. The base of the twister first winds up on a cast-iron worm, that is three inches in diameter at the top and about two at the bottom. The effect is to take up the slack quick, and apply the power at the bottom, the twister on the Springfield brake being only an inch and a half in diameter and straight. The upper part in the Hodge brake is supposed only to take up the slack chain, the lower part to apply the power. The fulcrum of the levers is an inch more than in the old Springfield brake; the short arm is seven inches instead of six. The link upon which the head is fastened to the arm of the truck, is, I think, about an inch and a half shorter on the Hodge brake than on the old Springfield brake.

Int. 112. What advantage, if any, does the dropping of the brakes toward the track have in holding the car?

A. It is generally believed among mechanics, although I am not able to give a positive reason for that, that the further under, or the nearer the track, we run our shoes, the more power we get. In other words, it is more effective in its grasp of the wheel. It will slide the wheel quicker to throw the shoe down under the wheel than it will to bring it up nearer the centre of the wheel.

Int. 113. What is the object of increasing the size of the shaft on which the chain winds in the Hodge brake, and als oin lengthening the short arm of the lever and lifting the brake bars from the track?

1855 A. If we gave it the same purchase that this old Springfield has, we should give it too much power on the wheels, and slide them. Consequently, we must reduce the power at some point, and we take the way we have taken to accomplish that. It could be accomplished in any other way. You might reduce the size of the brake wheel and it would effect the same thing; or decreasing the long arm of the lever would effect the same thing. The object is to decrease the power; we have got too much leverage.

Int. 114. Please look at the Tanner patent-office model, and note the point of connection of the truck-levers with the centre lever, and state whether this brake, when applied to the car as indicated in the model it should be, would apply more or less power to the brake-bars of each truck than the same brake will when attached to the lever of one truck.

A. Put up in this manner, it would have a great deal more power than it would attached to the lever of a single truck.

Cross-examined by S. D. Cozzens, esq., for plaintiff:

Cross int. 1. How long have these features in the arrangement of the Hodge brake, of which you have just spoken, been in use upon the Boston and Albany Railroad?

A. I cannot tell. They have been in use ever since I have been here.

Cr. int. 2. How long is that?

A. I have been here two years and four months. I found them in these same proportions in which they are now being used. In other words, I have not altered the proportions at all. That is the general arrangement. It is put on everywhere, to my knowledge. I am familiar with the use of the brake on other roads.

(It is agreed that these same features in the arrangement of the Hodge brake, of which M'r Adams has spoken, have been in use on the Boston and Albany Railroad since the first introduction of the Hodge brake on that road.)

Cr. int. 3. If you were at liberty to use either the Springfield brake, the Tanner brake, or the Hodge brake, as you might prefer, would you choose the Hodge brake?

1856 A. I should, most certainly.

Cr. int. 4. Were you present last Saturday with M'r Sayles; and did you see the Springfield brake applied on car No. 4, on the Connecticut River Railroad; and did you see the link of the chain catch on the eye of the windlass; and did you see said chain wind spirally around the windlass shaft when the brake was applied?

A. Yes, sir; I did.

Cr.-int. 5. Did you see the chains at both ends of the car catch?

A. Yes, sir. The eye-bolt that goes through the shaft; the link in which the eye is welded, doubled over on the eye one turn of the link, or lopped down—you might express it that way. Instead of pulling out straight, it fell down, and fell down on the outside of the eye. That is what it did, exactly; no uncommon thing. It is almost universal with that kind of twisters. It would do it on the Hodge brake, or any other brake. It will do the same thing on that same kind of stem, understand, but not on a cast-iron worm.

Cr.-int. 6. When you say "that kind of stem," you mean such a stem as is shown in Defendants' Exhibit, Large Springfield Brake, 124?

A. Yes, sir; I mean that.

Cr.-int. 7. Are the stems of all the Springfield brakes you now have on your cars like said exhibit?

A. I think they are.

Cr.-int. 8. How much does that "lopping down" of the chain, as you call it, instead of winding straight round the stem, take up the chain?

A. Well, the links, I suppose, are about an inch and a half long. It would not take it up over the length of the link, and I don't think it would take up the length of the link—that simple dropping down of one link.

Cr.-int. 9. When the chain winds spirally around the stem, how much would that take up the chain as compared with its winding straight?

A. That would depend altogether upon how spirally it wound. If the chain was very slack, it would spiral more, and of course take up faster.

1857 Cr.-int. 10. In other words, the more it spiralled, the more it would take up?

A. That is true. The more slack there was, the more it would spiral.

Cr.-int. 11. Assuming that in this two-chain Springfield brake one of the chains, from any cause, wound unequally as compared with the other, would not the application of the brake be different upon one truck from what it was upon the other?

A. Not necessarily.

Cr.-int. 12. I don't think you understand my question; I will put it again. Suppose, in this two chain Springfield brake, one of the chains begins to draw on the truck lever before the other one does, will not then the application of the brake be unequal on the two trucks?

A. M'r Cozzens, I can't answer that directly, without an explanation. I should answer it just as I did before—it would not necessarily apply the power unequally. But I say it needs explanation. I claim, just as I did before, that just as quick as one chain is taut it will wind straight around the twister; as long as either is slack, it will spiral, and take up faster, until the chains are equalized in length, and then they will both pull together.

Cr.-int. 13. Question repeated.

A. Well, I would modify my answer so much as this, that if there was an extreme amount of slack it would not be equal; but if there was only what would ordinarily occur in the natural wear of the brakes, I claim that there would not be any material difference.

(The question was once more read to the witness, and he answered, "It would make the power unequal.")

Cr.-int. 14. What do you know about what stops were made, as stated by you in your answer to the 34th direct question, except by hearsay?

A. I don't know anything about it, only by hearsay.

Cr.-int. 15. How do you know that the shoes referred to in answer to the 43d direct question were preserved, except by hearsay?

1858 A. Only by the report made to me, as ordering the result reported to me.

Cr.-int. 16. The same thing is true, is it not, in regard to your answer to direct question 47?

A. The answers to all these questions were made by report.

Cr.-int. 17. The same is true in respect to your answer to direct question 48, as to the weight of iron consumed?

A. Yes; my answer to all those questions came by report. They all came from subordinates, who are supposed to be subject to my order.

Cr.-int. 18. What is the ground of your knowledge in reference to your answer to direct question 51?

(Question and answer read.)

A. I don't know as I know how to answer that exactly to suit you. I took part in the consultation as to what was best to be done. M'r Whipple consulted me about that matter; and in regard to the wear of iron, &c., M'r Whipple and myself judged that was best.

Cr.-int. 19. You had nothing to do with puddling the iron of which these shoes were made?

A. No, sir.

Cr.-int. 20. How do you know it was the same puddle of iron?

A. I only know by hearsay.

Cr.-int. 21. How do you know, even if it were the same puddle of iron, that each shoe made from it would be of the same density and hardness?

A. I don't know that; but most mechanics conclude that, when the metal is all taken out of one puddle of iron.

Cr.-int. 22. Don't you know that it often happens that, even in a lot of iron made at the same time, different portions of it differ materially in respect to density, hardness, and amount of carbon?

A. Yes, sir; if the plan is laid for that. I admit that, if it is prepared for it.

Cr.-int. 23. Without laying any plan for it, do you not know that it frequently happens so?

1859 A. No; I don't know that it frequently happens so.

Cr.-int. 24. Did you see the heads referred to in answer to direct question 54 put under the car?

A. No, sir; I did not.

Cr.-int. 25. Do you know, of your own knowledge, that the same shoes were continued under those cars all the time that what you call that experiment lasted?

A. No, sir; only by report.

Cr.-int. 26. How do you know what you stated in your 59th answer, except by hearsay?

(Question and answer read.)

A. That is hearsay, of course, as you call it—report.

Cr.-int. 27. The same thing is true, I suppose, in regard to your answer to direct question 60—about the weight of iron consumed?

A. All those questions are answered from the same knowledge.

Cr.-int. 28. The same thing is true, is it not, in regard to your answer to direct question 63—about how it was reported that the trains were made up, and so on?

A. Yes, sir.

Cr.-int. 29. Is or not the same thing true in regard to your answer to direct interrogatory 75—in reference to the number of sets of shoes worn out, &c.?

A. No; I don't know that it is. That was reported in the same way. Those shoes have been kept up at Boston.

Cr.-int. 30. The same thing is true in regard to your answer to direct interrogatory 76, is it not?

(Question and answer read.)

A. Yes.

Cr.-int. 31. The same is true in regard to your answer to direct interrogatory 78, is it not?

(Question and answer read.)

A. It is.

Cr.-int. 32. Are you able to state from your experience in car-building what was the diameter of windlass wheels when single brakes were used on passenger-cars, previous to the introduction of double-acting brakes on such cars?

A. Well, I am not familiar with what was used, or the size of the wheel. I cannot answer that question.

1860 Cr.-int. 33. Do you know whether it was frequently customary, when single brakes were used on passenger-cars, to have a single brake at each end of the car?

A. No, I don't know that. Double brakes have been used pretty generally ever since I became any way familiar with car building.

Cr.-int. 34. Have you lately discussed with M'r Whipple, or examined for yourself, any scientific books in reference to the law of developing friction?

A. No, I don't know that I have read any book that would be called a specially scientific book upon that question. I have read articles at different times in relation to it, but not with M'r Whipple.

Cr.-int. 35. Have you read or examined any book lately, whether you call it scientific or not?

A. I say I have read articles in reference to it.

Cr.-int. 36. No book?

A. No book.

Cr.-int. 37. What articles have you read; and where were they?

A. In railway papers.

Cr.-int. 38. What were the articles?

A. I don't know as I could define them, so as to be very definite.

Cr.-int. 39. Can you state any railway paper in which you have read such articles?

A. In the Railway Gazette we get articles of that kind occasionally.

Cr.-int. 40. How lately have you read any such article in the Railway Gazette?

A. Almost every week or two we have articles referring to that.

Cr.-int. 41. How lately have you read any such article?

A. I have not read anything in regard to it for two or three months, possibly.

Cr.-int. 42. Have you read any such article in the Railway Gazette, or any other paper, since these Springfield brakes have been running on the Boston and Albany R. R.?

A. Not that had a bearing specifically upon friction, that I know of. I have taken no pains to look up the matter.

1861 Cr.-int. 43. How long have you known what you have stated to be the law of the development of friction, namely, that it is in proportion to the weight rather than to the amount of surface?

A. Well, I should have to answer that that was the general opinion.

Cr.-int. 44. How long have you possessed it?

A. I don't know as I could go back to that. I have entertained the idea for a good many years. There are a good many facts that mechanics get, which they do not get from any special teaching, but from general knowledge, that we pick up. We do not profess to have a scientific education; but there are certain laws and theories that we are governed by in our operations.

Cr.-int. 45. Have you understood that to be the fact since about the commencement of your experience as car-builder?

A. For a good many years I have understood the fact, that weight and speed made friction. These two items combined are supposed to make friction in the main.

Cr.-int. 46. What I want to get at is, whether you have known that since about the time you commenced car-building?

A. Well, of course, I hope I have been learning some general matters all the time. I did not know so much, nor think so much about them, before I was placed in charge of the work as I have since; I had no occasion to.

Cr.-int. 47. As near as you can state, about how many years have you known it?

A. Say for fifteen years that idea has been prevalent in my mind as the law.

Cr.-int. 48. Did you ever know of a Springfield brake being in use on any railroad in the United States until within the last few months?

A. No, sir, I did not.

Cr.-int. 49. What is the length of the short chains and rods on the five cars on your road which have on the old Springfield brake?

A. On four of the cars the chains and rods are 3 feet 4 inches from the windlass-shaft to the first lever. On the other car they are 3 feet 8½ inches.

1862 Cr.-int. 50. About how long are the long chains and rods on said cars?

A. They are about 40 feet from the windlass to the lever, on cars Nos. 123 and 124. On the other three cars they are somewhat shorter, as the cars are shorter.

Cr.-int. 51. What is the length of the trucks of cars Nos. 123 and 124?

A. They are about 11 feet, and from centre to centre of axles, 7 feet.

Cr.-int. 52. Has your attention been called to several trucks of passenger-cars with regard to the swing-beam arrangements on said trucks? If so, please state what trucks they were, and how much longitudinal motion you found in said trucks.

A. My attention has been called to the trucks under passenger-cars Nos. 111 and 50. There was no material longitudinal play—a very little in 111, but not enough to make any difference. They had been built and run about two years. I saw another truck which had been run a number of years; I can't say how long. It was equally as tight. There was not perceptible wear in any one of the three trucks mentioned.

Redirect:

Int. 115. Do you wish to have it understood that the three pairs of trucks mentioned in your cross-examination represent a fair average of the longitudinal motion of other pairs of trucks on your road?

A. No; I don't think it is a fair average. As a general rule, I think there is more shrinkage and wear, hence more motion.

Int. 116. In comparing the trucks that you now build for the Boston and Albany Railroad, with the trucks that you built when you first became connected with railroads, what is the difference between the extreme lengths and between the centre of axles?

A. Four feet six inches and four feet eight inches used to be the common spread. We have old trucks on our road now, four feet eight inches, while our new trucks are seven feet. I allude to trucks of passenger-cars.

1863 Int. 117. What is the length of chains on the old Springfield brake, as seen on car No. 124? And what is the length of chain on car 123, same brake?

A. On 124, the chains are from thirty inches to three feet. On 123, the chains are only fifteen inches long. The same may be said of the other three cars.

Int. 118. Why this difference in the chains on 124 as compared with the other cars?

A. I can't account for that, only that the short chains have been put on since the car first went out; the chains have been broken, and a rod substituted for a portion of the chains. That is the only way I can account for it.

Int. 119. What disadvantage has the brake necessarily worked under on these cars having the short chains, in consequence thereof?

A. When the shoes have become well worn, the chain would be all taken up on the windlass, which would come in contact with the rod before you could get the power of the brake upon the wheel. The consequence was that the brake failed to hold as it should. That was the reason of one complaint that was made to me in relation to the brake. There has been no complaint that I ever heard of in relation to No. 124.

Int. 120. Have you taken any steps, or do you intend to, in relation to making a change in all the cars having the Springfield brake on, to make them comparatively of the same length?

A. Yes, I intend to have them all made the same as 124.

Int. 121. When that is done and the wear of the shoes is properly taken up, what must be the practical operation of the brakes?

(Objected to.)

A. I see no reason why they shouldn't hold as well as any brake. In fact, I think they do.

Int. 122. Have you examined the train of five cars on the Boston and Albany Railroad to see how the long and short connections of the
1864 old Springfield brake are attached to the windlasses at either end of the cars? If so, what is the result of your observations?

A. I have examined them, and find the long connection is connected with the windlass-shaft above, and the short one below, or exactly the reverse of the "Exhibit, large Springfield brake, 124." The connections on all five of the cars are alike and as already stated.

Int. 123. I wish further to call your attention to the subject-matter of generating frictions, and will inquire: In stopping a train of cars by means of the brakes, what may the friction be called by which it is done?

A. I should call it "rolling friction."

Int. 124. What may the friction be called that comes into action when the rolling friction ceases, if the car is still in motion?

A. "Sliding friction."

Int. 125. At what speed does sliding friction take place?

A. At very slow speed.

Int. 126. Will you please define the law of generating friction as applied to brakes?

A. The law of friction as applied to brakes is, that friction is wholly independent of the extent of surface in contact. The friction which accompanies motion is also independent of the velocity with which the body moves.

Int. 127. By whose authority do you state this law of friction; and upon what experiments is it founded; when were they made, and by whose order?

A. I learned this from a work written by W. H. C. Bartlett, LL. D., professor of natural and experimental philosophy in the U. S. Military Academy at West Point, entitled "Elements of Analytical Mechanics," published in 1854 by A. S. Barnes & Co., New York. The law is founded on experiments made by M. Morin, at Metz, in 1831, 1832, and 1833, by the order of the French Government.

Int. 128. Will you please quote from M. Morin's experiments, as introduced into D'r Bartlett's work, that it may be seen how slight is the variation between extreme pressures, surfaces and velocities?

1865 A. In these experiments, "the surfaces of contact were made to range in extent from 1 to 84; the forces which pressed them together, from 88 to 2,205 pounds; and the velocities, from the slowest perceptible motion to $9\frac{8}{10}$ feet per second; causing them to be at one time accelerated, at another uniform, and at another retarded; yet throughout all the wide range of variation, in no instance did the ratio of pressure to the friction differ from its mean value of 0.478 by more than $\frac{1}{24}$ of this same fraction."

Int. 129. The deduction from these experiments is what?

A. The deduction is that rolling friction is wholly independent of the extent of surface in contact, and that it is independent of velocity.

Int. 130. The deduction, as applied to double and single brakes, is what?

A. That the same pressure is equally effectual applied to two pair of wheels, in stopping a car, as when applied to four pair of wheels, provided the wheels do not slip or slide.

Int. 131. Assume that all double brakes are more or less unequal in applying the presure to the wheels of the car from the different inclinations of the levers, and from other causes; does such inequality in any way affect the retarding power of the brake, so long as the wheels continue to roll?

A. I don't think it does.

Int. 132. Wherein, then, is the single brake inferior to the double brake?

A. The single brake is less effectual to stop a car, just so far as it fails to generate friction enough to stop the car on time; and if the same power is applied to one truck as is applied to both, and no wheels are slid, the retarding force is the same.

Int. 133. Then, so far as stopping the car is concerned, a single brake is doing just as effectual service as a double brake under the same pressure, so long as the wheels under pressure roll; is that so?

(Objected to.)

A. Yes; that is my opinion.

Int. 134. Upon what law or fact do you base your opinion?

1866 A. Upon the law as laid down by D'r Bartlett, already referred to, based on the experiments ordered by the French Government, coupled with my own experiments.

Int. 135. Would or not a slight release of presure by the brakeman, just before the car stops, prevent the wheels from sliding?

A. I think it would.

Int. 136. In view of the foregoing statements and conclusions in relation to generating and applying friction to brakes as a standard of judgment, and allowing that three brakemen are necessary to a train of six cars—double brakes—how many brakemen would it require to make the same time in stopping the same train with single brakes?

A. I should think one additional man would handle the train ordinarily as well as the three would with the double brakes.

Int. 137. Have you consulted any other mechanical work on friction; if so, what work; by whom edited; where published, and by whom?

A. I have consulted a dictionary entitled a "Dictionary of Machines, Mechanics, Engine-work and Engineering," edited by Oliver Byrne, published in New York, by D. Appleton & Co., in 1850.

Int. 138. To what single proposition does Byrne reduce the whole doctrine of friction?

A. On page 707, under the article of Friction, he says: "The whole doctrine of friction may be reduced to the single proposition, that the friction is proportionate to the pressure upon the surfaces in contact, and independent of the extent of the surfaces and of the velocity of their motion."

Int. 139. On what experiment is this proposition founded?

A. On experiments conducted by the French Academy, conducted by M. Morin by order of the French Government.

Int. 140. What experiments in braking or stopping a car have you witnessed of late, verifying this proposition? Please answer fully in detail.

A. I witnessed yesterday an experiment on car N, on the Connecticut River Railroad. The first trial was with the Tanner brake, at a
1867 speed of about 30 miles an hour, as I estimated it. The car was stopped, being cut off from the engine in 510 feet from the point of application of the brake. We then made a second trial, by disconnecting one truck from the centre lever, thus reducing it to a single brake. Running at as near the same speed as possible, and under the same conditions, the engine cut off from the car at the same point, and the brake applied by the same brakeman in the same manner, the car was stopped six feet short of the point of stoppage on the first trial with the Tanner brake. We then, to make the thing more positive, made a third trial with the single brake, reconnecting the truck just mentioned and disconnecting the other truck, and at the same rate of speed, and all circumstances as nearly the same as possible, stopped at the same point as on the first trial with the Tanner brake. We then connected both trucks, and made a fourth trial with the Tanner brake, and under the same circumstances, and stopped at the same point of the first trial. The speed and circumstances were all, as nearly as possible, the same in all the trials.

Int. 141. Have these tests been made on the cars of different roads to ascertain how much longitudinal motion there is between the bodies of the cars and the trucks; if so, have you a knowledge of the same; how were these tests made; on what cars, and with what results?

A. There have been made such tests, and I have a knowledge of the same. They were made by myself and M'r Robert Hitchcock, of the Connecticut River Railroad. We secured one truck by blocking the wheels firmly, then by barring the other truck as far as possible toward the end of the car. Then we made a plumb-line from a point on the body of the car upon the side of the truck. Then we reversed the motion of that same truck, and barred it the other way under the car as far as possible; then dropped a plumb-line from the same point on the body of the car, as before, and made a line upon the truck, and found, upon Boston and Albany car No. 101, the motion was three-quarters of an inch; on New York and New Haven car No. 57, the motion was 1⅛ inches; same road, car No. 17, the motion was one inch; New York and Boston Express Line passenger car No. 23, the motion was 1868 1⅛ inches; Hartford and New Haven passenger car (excessively strained, being pressed against the head-block or snubbing-post at the end of the truck), the centre of the bolster was forced by the centre of truck from 3½ inches; Connecticut River Railroad car No. 3 there was two inches motion; same road, car "H," the motion was 1⅛ inches; same road, car "C," the motion was 1⅝ inches; Hartford, Providence and Fish. Railroad car No. 5, the motion was ¾ inch; same road, car No. 28, 1 inch motion; same road, car No. 26, ¾ inch motion; same road, car No. 7, 1 inch motion; same road, car No. 17, ¾ inch motion. We also made an experiment with an engine attached to Connecticut River Railroad car No. 3 (already referred to), and set the brakes as strongly as we could, and gave the motion ahead and held on. Then we made a plumb line, as before, from a given point on the body, and marked the side of the truck. We then gave the engine motion backward, and held on; and from the same point on the body of the car we dropped another line on the side of the truck, and found the motion 2½ inches.

Int. 142. Will you please look at the 52d cr. interrogatory and the answer to the same, and state whether you see anything therein that seems to conflict with the tests or experiments you have testified to?

A. I should say those trucks belonging to cars 50 and 111, and the other truck referred to in said answer, were the exception rather than the rule.

Int. 143. Had the other truck referred to been exposed to the weather and the timbers become swollen?

A. I shouldn't attribute it to that.

Int. 144. To what would you attribute the tightness in the parts pertaining to the swing-bolster of the truck, which had been run a number of years?

A. I cannot give any good reason. It is a very unusual thing to find the swing-bolster of an old truck without considerable space between bolster and cross-timbers.

Int. 145. What construction of truck gives the most longitudinal motion, and what least?

A. Trucks built with narrow bolsters will give more than those with broader ones.

1869 Int. 146. Which mode of construction was most in use ten years ago?

A. The narrow bolster; from 8 to ten inches wide, or just sufficient space to receive the springs. If elliptic springs were used—two, side by side—there would be required only about 8 or 9 inches timber.

Int. 147. What width of bolster is now in use upon passenger-cars of different roads, so far as your knowledge extends?

A. I can't tell exactly our width now from memory, but we are using four elliptic springs, side by side, which require double the width of the old style. Our opening between timbers is about 17 inches. The New York Central Railroad are putting into many of their cars six elliptic springs, side by side, necessarily requiring about 8 inches more space, which makes the opening about 2 feet. The New York and Erie Railroad, I am told, are adopting the four-spring mode.

Recross:

Cr.-int. 53. Were the trucks of the passenger-cars Nos. 50 and 111, and also the other truck referred to in your 52d cross-answer, trucks which belonged to the Boston and Albany Railroad Company; and was your attention called to them in the yard or shop of that company; and were they the only passenger-trucks which were about there at that time, which were not under cars?

A. My attention was called to them in the yard. I can't say positively whether there were other trucks there or not.

Cr.-int. 54. You don't remember seeing any other trucks there at that time?

A. No.

Cr.-int. 55. You have had a good deal to say about the law of friction. Will you please state whether the quotation you have made from Professor Bartlett's book and Byrne's dictionary contain all the matter upon which you rely, as respects those two books, for the conclusions you have stated?

A. Yes.

Cr.-int. 56. Suppose a car-brake to be proposed to you as a double-acting brake, and suppose that in that brake, after the parts had
1870 been so adjusted that the brakes would operate properly while the car was on a straight track, the natural tendency was, that when the car with the brakes applied passed from the straight track on to a curved track, it would cause the brakes of one truck to bind so hard as to slide the wheels of that truck, and would loosen the brake of the other truck; would such a brake be a practical one for use on railroads?

A. No; upon that supposition I don't think it would be considered so.

Redirect:

Int. 148. Is there any curve on the Boston and Albany Railroad, or any other road within your acquaintance, where the old Springfield brake,—for illustration,—if applied to a car and run upon said curve, would have the brake so applied as to slide the wheels in one truck, and let the brake loose on the other?

A. Not on the main line of any road.

Recross:

Cr.-int. 57. State upon what curves of the Boston and Albany Railroad, or of any other road, you have noticed the operation of the Springfield brake, when the car having it on was passing, with the brakes applied, from a straight track on to the curve; and state how such Springfield brake was arranged.

A. I have noticed the cars with the Springfield brake on, on the Boston and Albany Railroad, as they came down the grade into the Springfield depot, on the east side, on the curve from one track to the other, and did not see any perceptible difference in the pressure upon the trucks. I have noticed it when I have been on the trains, passing into Russell depot, for instance, and have never noticed any perceptible difference in the pressure upon the trucks. The curve at Russell is not a very sharp one. I don't call to mind any other curves that I have noticed the operation of the brake on. I haven't noticed the operation of the brake on any other than the Boston and Albany Railroad. The Springfield brakes that I have noticed were the same as "Defendants' Exhibit, 1871 large Springfield brake, 124," except the long chain and rod are above on the windlass-staff instead of below.

Cr.-int. 58. What is the radius of the curve you speak of, on the east side of the Springfield depot?

A. I couldn't tell; but the same that is ordinarily used in passing from one track to another on a double-track road, the inside rails of the two tracks being six feet apart.

Cr.-int. 59. The curve at Russell is quite a slight one, isn't it?

A. No; I shouldn't call it a very slight curve. I should call it a sharper curve than the one passing from one track to the other, just spoken of.

Cr.-int. 60. Is this curve just spoken of, between the two tracks, long enough to enable both trucks of a passenger-car to be on the same curve at the same time?

A. I should think not on the same curve; but one would be on the reverse curve. It is a reverse curve there, and one truck would be on one part of the S while the other was on the other part, if the car was entirely on the curves. But in passing on or off the curve one truck would be on the curve while the other was on the straight track.

Redirect:

Int. 149. Does the train of five cars, to which the old Springfield brake is applied, pass over this reverse curve under the brakes on its arrival from Boston; and is there any perceptible difference in the efficiency of the brakes while passing such curve?

A. It does pass over such curve every other day. I have never noticed any perceptible difference. I have noticed its passage over the curve several times.

F. D. ADAMS.

Deposition of E. S. Dudley.

Int. 1. What is your name, age, residence, and occupation?

1872 A. My name is E. S. Dudley; age, 38; occupation, machinist, working for the Boston and Albany Railroad, in the car-department.

Int. 2. Will you please state whether your attention was called to certain shoes that were produced by Mr Adams, master car-builder, and whether you were requested to put a certain mark on them, whereby you could identify them?

A. I was told to put a mark on them, or a certain mark, for a certain purpose.

Int. 3. Will you please look at "Defendants' Exhibit, brake-shoes, 124," and state whether you find them marked.

A. These are marked, all of them. I have looked them over.

Int. 4. How did you mark them?

A. I marked them with a chisel mark; a cross on the side.

Int. 5. In addition to that, did you put a private mark on?

A. I did.

Int. 6. What was that private mark?

A. The private mark is a centre-punch mark; "prick punch," I call it.

Int. 7. Do you find the cross and your private mark, the prick-punch mark, on each brake-shoe of car No. 124?

A. I do, sir.

Int. 8. You will now please look at the shoes purporting to belong to car No. 123, and see if you find the cross and also the prick-punch mark, which you say is your private mark.

A. I do. I find the cross on all, and the prick-punch mark on all except one; that was probably neglected. But the cross is on that one and I think it is the same.

Cross-examined by the complainant, M'r Tho's Sayles:

Cr.-int. 1. Do you know that these brake-shoes of which you have just spoken are the ones that were used on cars No. 123 and No. 124?

A. I was not familiar with what cars they were going on, nor for what purpose they were to be used. I was not informed of any of the
1873 particulars at all, only that I was to mark them so that I could
identify them in case I was called upon. They were brought into the shop and drilled, and then I was told to put a mark on them, so that I could identify them; and they were carried out to the depot and sent off.

Cr.-int. 2. Where was this marking done?

A. In the Boston and Albany car-shop here in Springfield.

Cr.-int. 3. Was that before the shoes had been used on the cars?

A. Yes, sir; they were new shoes.

Cr.-int. 4. Is it not possible that other shoes may have been marked in the same way, and substituted for those you marked?

A. I think not. I don't think they could have. They might, possibly, by taking pains. I think the marks on those are the same that I used. They show the same chisel-mark that I use in marking the cars.

Cr.-int. 5. Another chisel of the same kind would have made the same mark?

A. Yes, sir; if it was just like this one. For my own curiosity, I preserved the chisel just in the same state that it was when I marked them. I have not used the chisel since. I laid it away, so that it could not have been used. I can produce the chisel, if necessary.

Redirect:

Int. 9. Did you ever communicate to any one, until the present time, what your private mark was?

A. No, sir.

E. S. DUDLEY.

Deposition of John W. Clark.

Int. 1. What is your name, age, residence, and occupation?

A. John W. Clark; age, 35; residence, Springfield, Mass.; conductor on the Boston and Albany Railroad.

Int. 2. How long have you been a conductor?

1874 A. About seven years, I think.

Int. 3. What train do you run as conductor?

A. It is known here as the morning accommodation train.

Int. 4. And it runs to what place?

A. To Boston. On the lower end of the road it is known as No. 50. We go by the numbers there.

Int. 5. And it returns when?

A. In the evening here; due here at 7 o'clock.

Int. 6. Please state, if you know, when cars No. 123 and No. 124, of the Boston and Albany Railroad, were put to service in your train.

A. The 12th of December, 1871, they commenced running regularly. I ran No. 124 one trip, I think, trying the car, or something, and then took them on regularly.

Int. 7. And ran them to what time?

A. I left them in Boston, at noon, the 29th of January, 1872.

Int. 8. Were they then taken out of your train?

A. They were, sir.

Int. 9. Had those cars been run in any other train?

A. No, sir; they were new cars. They might have been out on a trip trying them, but no regular service.

Int. 10. Please look at "Defendants' Exhibit, large Tanner brake, 123," and state whether it is a correct representation of the brake as applied to car No. 123, and run in your train.

A. It is just the same, for everything I can see; the model of it; connected in the same way.

Int. 11. You will now please look at "Defendants' Exhibit, large Springfield brake, 124," and state whether it is a correct representation of the brake applied to car No. 124, and run in your train.

A. It is.

Int. 12. Please state whether or no you kept count of the stops made by your train, so long as cars No. 123 and No. 124 were run in it.

A. I did.

Int. 13. How many stops did car No. 123 make, and how many stops did car No. 124 make, as kept by yourself?

1875 A. No. 123 made 47 stops each day, and No. 124 made 34 stops each day.

Int. 14. What was the whole number of stops made by No. 123?

A. No. 123 made 1,521 stops, and No. 124 made 1,479 stops.

Int. 15. You say that No. 123 made 47 stops a day, and No. 124 made 34 stops a day. Please explain why one car made more stops per day than the other.

A. In coming from Boston to Springfield No. 123 was run on a way train from Boston to Worcester; No. 124 came up on an express train, and they were coupled together at Worcester, and came from Worcester to Springfield together.

Int. 16. How many stops would No. 123 make on the way train to Worcester, and how many stops would No. 124 make on the express train to the same place?

A. I don't know as I can tell that.

Int. 17. It would be the difference between 34 and 47, would it not?

A. Yes, sir; of course it would. The express train makes only two stops—at the crossing and at Framingham. There were 13 stops more for the No. 123 car.

Int. 18. At what time were the shoes on No. 123 worn out, or considered as unfit for further use?

A. It was the 18th of January, 1872.

Int. 19. And on what day were the shoes on No. 124 worn out or considered as unfit for further use?

A. The 29th of January, 1872.

Int. 20. If I understand it, this difference of time in which the shoes were worn out in No. 123 and No. 124 was owing to the fact that No. 123 made 13 more stops a day than No. 124?

A. Yes, sir.

Int. 21. If I understand you, then, car No. 123 made 1,521 regular stops up to the 18th of January, and No. 124 made 1,479 stops up to the 29th of January?

A. Yes, sir.

Int. 22. In what part of your train did cars No. 123 and No. 124 run?

1876 A. They were on the rear of my train from Springfield to Boston; they were both rear cars. One was the rear car on the way-train and one was the rear car on the express-train from Boston to Worcester.

Int. 23. If I understand you, then, No. 123 ran in the rear of the train one way, and No. 124 ran in the rear of the train the other way?

A. Yes, sir. No. 124 ran in the rear going east and No. 123 came back from Worcester to Springfield in the rear coming up.

Int. 24. And they were always coupled together, except, as already stated, on the other end of the road?

A. Yes, sir; every day.

Int. 25. What did you understand at the time was the object of your keeping count of the stops made by your train while cars No. 123 and No. 124 were run in it?

A. Well, they were testing the brakes, and to see if the shoes wore the same.

Int. 26. When the shoes were worn out under the brakes, what was done with cars No. 123 and No. 124? Did they continue in further use in your train, or were they taken out and put into some other train?

A. They were taken away, both of them, on the 29th of January.

Int. 27. Were you ever a brakeman on the Boston & Albany Railroad; and, if so, when and for how long?

A. I was brakeman about four years. It is 18 years ago since I commenced, the 17th of February.

Int. 28. Eighteen years since you commenced, first as brakeman and then as conductor?

A. Yes, sir; and I was baggage-master three years.

Int. 29. Did you at any time operate the brakes on cars No. 123 and No. 124?

A. I did; I tried them several times when they first commenced running.

Int. 30. To which brake did you give the preference?

A. I thought No. 124 worked the easiest; took hold the best and quickest.

1877 Int. 31. What reason, if any, have you for thinking that the old Springfield brake on No. 124 seemed to take hold best?

A. I thought it would slack up the train quicker.

Cross-examined by the complainant, Tho's Sayles:

Cr.-int. 1. Who were the brakemen on your train when cars No. 123 and No. 124 were used?

A. Charles Haradan broke on those two cars. I had two other men, but they did not use those brakes at all. He was the hind brakeman, and he used those two cars.

Cr.-int. 2. Did he brake them all the time during the time they were in your train?

A. No. Between Boston and Worcester one came up on another train. I don't know what that brakeman's name was. No. 123 came up to Worcester on the half-past one train.

Cr.-int. 3. Was he the only brakeman who ran on your train that used these brakes all the time they were in your train?

A. Yes, sir; they were always on the hind end, and he was the hind brakeman. Each man has two cars.

Cr.-int. 4. Did you know why these brakes were put on those two cars?

A. To try. That is what they told me, that they were trying the brakes.

Cr.-int. 5. Did you know why they wanted to try them?

A. No; I did not.

Cr.-int. 6. Did you know there was any suit pending?

A. Well, no. The brakeman was telling me one day that there was a lawsuit about them. He told me a man was putting them on; that there was a lawsuit about them.

Cr.-int. 7. Was there any other car used in your train except those two?

A. Yes, sir. I have five cars going east, and four coming up nights; sometimes more. That is the usual train.

Cr.-int. 8. What kind of brakes did those other cars have?

A. They have the Hodge brakes—the Hodge patent.

Cr.-int. 9. You say you think the brake on No. 124 worked better than the one on No. 123?

1878 A. Yes, sir. No. 123, I think, was more stiff. It did not seem to go on so well.

Cr.-int. 10. Did the brake on No. 124 work better than the brakes on the other cars, the Hodge brake?

A. No; it did not.

Cr.-int. 11. It worked well, didn't it?

A. Well, I shouldn't as lief work it. I think it works harder; that is, I think it takes more strength to set it up tight.

Cr.-int. 12. Couldn't you stop the train as well with it?

A. I presume you could set it tight. I presume the wheels might be slid with it. That is all a brake can do.

Cr.-int. 13. You have often operated the Hodge brakes, I presume?

A. Yes, sir. They are in pretty general use on this road. They work very easy, the Hodge brakes do.

Cr.-int. 14. Did you try those brakes on car No. 123 and No. 124 often?

A. Well, no; not very often. When they first came on, sometimes I would take hold and set them up.

Cr.-int. 15. Were the brakes on No. 123 and No. 124, when they were together in the train, both applied at every station?

A. O, yes.

Cr.-int. 16. Where is this Charles Haradan?

A. He is running from Springfield to Albany now, on J. B. Adams's train.

Redirect:

Int. 32. Please state whether the train in which these cars run was stopped on curves; or, in other words, whether there are any stations located on curves on the road in your run.

A. Yes, sir; several; Wilbraham, Brookfield, and Rochdale.

Int. 33. Please state if you have observed any difference in the holding of the brake when the train was stopped at the stations located on curves.

A. If the brake is set when the car is on a straight line, and then it strikes a curve, it tightens it.

1879 Int. 34. Does the same thing apply to both these brakes?

A. Yes, sir; to any brake. If it is set on a straight line, and then you strike a curve, the tendency is to tighten it.

Int. 35. And that applies equally to one brake as another?

A. Yes, sir; it would have a tendency to tighten the brake, so that the car would stop quicker.

Int. 36. When the brakes are set on a straight track and the cars then run on to a curve, it has a tendency to tighten any brake?

A. Yes, sir.

Int. 37. The Hodge brake as well as any brake?

A. O, yes, sir; any brake. When it strikes a curve it would spring the trucks and draw it tighter.

Int. 38. Please state if you have observed whether the chains in "Defendants' Exhibit, old Springfield brake No. 124," overlap each other in other in setting up the brake.

A. I never knew that they did.

Int. 39. Have you any reason to believe that the chains did overlap? [Plaintiff objected.] Of course you did not get down under a car when it was running to look at the brake; it is not expected that a man would do that; it is very dangerous business.

A. I never heard any complaint about it in any way.

Int. 40. Would a brake, in your judgment, be an effective brake upon both trucks, provided the chains did overlap each other?

A. I should not think you could set them if they were lapped.

Int. 41. Should you deem it safe to run a train, all the cars of which were equipped with the old Springfield brake?

A. I should think it would be safe, certainly.

Recross:

Cr.-int. 17. You never saw the brakes when they were applied, did you?

A. No, sir.

Cr.-int. 18. Supposing a brake on a car should be applid on a
1880 straight track, and the brake set with the ratchet, and then that
running the car on a curve would tighten the brakes on one truck, so as to make the wheels slide, and loosen them on the other truck of the same car, would that be a safe brake, in your judgment, to run on a train of cars?

A. You could not tighten the brake.

Cr.-int. 19. That is not the question. I ask you to suppose the case. I have not said there is any such brake in existence.

A. You couldn't tighten it on one truck and have that loosen the other. It could not work so.

Cr.-int. 20. Supposing it will do that, would it be a safe brake?

A. If it slid the wheels it would be a good brake.

Cr.-int. 21. You say it could not be done, and if it slides the wheels it is a good brake. Now, sir, supposing the brake is applied on a straight track, as I first stated, hard enough to stop a car, ordinarily, at the station, but not to slide the wheels, and that the brake is set with the ratchet, and the car runs from there on to a curve, and, by running on to the curve, the brakes are tightened on one truck so as to slide the wheels, and the brake is loosened on the other truck,—supposing the brake would do that, would it be a safe brake to put on a train of cars?

A. Yes, sir. If it would slide the wheels, it would be a good protection enough.

Cr.-int. 21. If it slid the wheels on one truck, and loosened them on the other, would it be a good brake?

A. It would not do that.

Cr.-int. 22. I say, if it does that?

A. I see nothing the matter with the brake, if it will slide the wheels.

Cr.-int. 23. If the principle of the brake is such that it will slide the wheels on one truck by going on a curve, and loosen the wheels on the other truck, would that be a safe brake?

A. Yes, sir. If one set of wheels was sliding, and the other was loose, it would stop the train. They won't slide a great ways.

Cr.-int. 24. You think a brake of that kind would be a safe brake?

1881 A. Yes, sir.

Cr.-int. 25. You say, if the wheels slide, it is a good brake?

A. Yes, sir. That is all a brake can do. Set it tight enough to slide the wheels; that is doing all a brake can do, and more than it ought to do.

Cr.-int. 26. Will a brake stop a car quicker by sliding the wheels, than it will when it is applied so as to bring the wheels almost to the sliding point, without sliding them?

A. When it is almost at the sliding point, it holds better than it will at almost any other point. I don't think a car will stop so quick when the wheels are sliding.

Cr.-int. 27. Then you think it would be a good brake, if it slid one set of wheels in going on a curve, and loosened the set on the other truck, do you?

A. Yes, sir. The car would not go a great ways if the brake held it that much.

Redirect:

Int. 42. In running car No. 124, in your train, did you observe any tightening of one truck, and slacking of the other, on a curve?

A. No, sir. I never observed any such thing.

Int. 43. Do you think any such thing occurred on any curve over which you run with that car while it was in your train?

A. No; I don't think it could. I don't see how it could, any way, when connected through from one truck to the other.

Recross:

Cr.-int. 28. Did you ever get under a car, so that you could look at the brakes when applied on a curve?

A. No; I don't know that I ever have. That is not a very good position to see.

Redirect:

Int. 44. Had the circumstances alluded to in the previous interrogatories by complainant, happened on car No. 124, when running 1882 from a straight track to a curve, to wit, tightening up one truck, and loosening the other, so that one would hold but little, while the other held much, would you have been likely to discover a difference in holding the car?

A. No; I don't know that I should.

JOHN W. CLARK.

Deposition of Benjamin Ray.

Int. 1. What is your name, age, residence, and occupation?

A. Benjamin Ray; age, 39; car inspector of the Boston and Albany Railroad.

Int. 2. How long have you occupied the position of car inspector on the Boston and Albany road, at Boston?

A. Since 1850—22 years; 5 years on freight, and the balance on passenger-cars.

Int. 3. Does looking after the brakes, and adjusting and repairing the same, come particularly under your charge as inspector of cars?

A. A part of them, not the whole on the road. All that stay at the Boston and Albany depot in Boston, I do.

Int. 4. What kind of brakes did you find on car No. 123 and car

No. 124, of the Boston and Albany road, when they first came under your observation?

A. The Tanner brake was on No. 123, and this old Springfield brake on No. 124.

Int. 5. You will please look at "Defendants' Exhibit, large Tanner brake, No. 123," and state whether it correctly represents the application of that brake to car No. 123, as you saw it when it first came to Boston.

A. Yes, sir; I think it is the same.

Int. 6. What was the length of long and short arms of the truck-levers?

A. Twenty-seven inches, the long arm; the short arm, six.

Int. 7. What was the diameter of the windlass-wheel used at that time?

1883 A. A sixteen-inch wheel.

Int. 8. The iron on which the chain wound was how much?

A. An inch and a half.

Int. 9. Is that the common standard of windlass-wheel used on your road,—sixteen inches?

A. Yes, sir.

Int. 10. You will now please look at "Defendants' Exhibit, large Springfield brake," and state whether it correctly represents the brake as seen by you on car No. 124, when it came to Boston.

A. It does, sir.

Int. 11. Is the arrangement of levers the same on this as on that car?

A. It is, exactly.

Int. 12. The windlass-wheel and shaft are the same?

A. The same size.

Int. 13. About what time of year, or month in the year, were these brakes first noticed by you at Boston?

A. I think I noticed them about the 8th and 12th of December, 1871.

Int. 14. At that time were the cars new, or had they seen some service?

A. They were new.

Int. 15. What kind of wheels did you find on those cars?

A. Steel-tired wheels.

Int. 16. What was the weight of the brake-shoes used on them?

A. The separate heads weighed twenty-nine pounds.

Int. 17. And there were how many heads to a car?

A. Eight.

Int. 18. The whole weight, therefore, to each car was how many pounds?

A. Two hundred and thirty-two.

Int. 19. About what time did the cars, No. 123 and 124, with the aforesaid brakes on, commence running; and in whose train did they run?

A. They were put into M'r Clark's train, No. 124, Dec. 8th, 1871; No. 123, Dec. 12th, 1871.

1884 Int. 20. And how long did those cars continue to run in M'r Clark's train?

A. Until January 29th. No. 123, until January 18th. It wore out half a set of shoes between that time and the 30th of January.

Int. 21. Of which no account was made?

A. Yes, sir.

Int. 22. When the shoes were taken off from No. 123, did you weigh them and take note of the amount of iron consumed?

A. Yes, sir.

Int. 23. What did you find to be the consumption of iron?

A. Seventy-six pounds on No. 123.

Int. 24. Did you also weigh the iron on car No. 124, with the old Springfield brake; if so, what did you find to be the consumption of iron on that car?

A. Yes, sir; seventy-seven pounds—one pound difference.

Int. 25. Did you put a particular mark on the shoes of No. 123, so that you could identify them?

A. Yes, sir.

Int. 26. What was the mark?

A. A single cross, pricked on the face of the shoe with a cold chisel.

Int. 27. I had reference to those on the box.

A. Those were marked with two crosses; a tally, two straight marks, and then crossed with one.

Int. 28. What mark, if any, did you put on the shoes of No. 124, that were taken from M'r Clark's train?

A. I did not put any mark on them. Those are not marked. I put that mark on the shoes to identify them when I put them into the soda to take the grease off.

Int. 29. To distinguish the shoes of one car from the shoes of the other?

A. Yes, sir.

Int. 30. In further testing the efficiency of the Tanner brake on No. 123, and the old Springfield brake on No. 124, what further came to your knowledge in relation to brake-shoes for the same?

1885 A. I received two sets of shoes from M'r Adams to put on those two cars.

Int. 31. When those shoes came to you from M'r Adams did you note any particular mark on them; if so, what was that mark?

A. There was a cross on each shoe.

Int. 32. Will you please look at shoes marked "Defendants' Exhibit, brake-shoe 123," and then at "Defendant's Exhibit, brake-shoe 124," and state whether you find on them, as produced here, the same mark that you found on the ones sent to you in Boston, by M'r Adams?

A. Yes, sir; I have looked at them all round, and I find the mark on all of them.

Int. 33. Were you aware at that time that there was any other mark on them than the cross?

A. No, sir.

Int. 34. Is there any doubt in your mind as to whether the shoes here marked Exhibits 123 and 124 were worn out on the cars on which they purport to have been?

A. No, sir; I have no doubt at all.

Int. 35. Into whose train were these cars put after being taken from M'r Clark's train?

A. M'r Jennings'.

Int. 36. Is said train made up by yourself in Boston?

A. No, sir; made up by the yard man in Boston.

Int. 37. Are you informed as to the manner in which it is made up?

A. Yes, sir.

Int. 38. Please state how it is made up and where it runs to when it leaves Boston?

A. When it arrives in Boston there is a switching engine that takes one car at a time and shoves them in on the back track so as to get the mail car, baggage-car, and smoking-car ahead.

Int. 39. How many cars compose this train when made up?

A. Five.

Int. 40. Please name the cars.

A. There is a mail car, baggage-car, smoking-car, and two passenger-cars—No. 123 and No. 124.

1886 Int. 41. Do I understand that that is the regular train which M'r Jennings takes out from Boston every morning?

A. No, sir; every other morning.

Int. 42. What does he take on the alternate mornings?

A. He takes another train, similar to that.

Int. 43. What brakes are on that train?

A. Hodge brake.

Int. 44. To what point does this train run after leaving Boston?

A. It runs to Albany.

Int. 45. And when does it return?

A. It returns every other day—three times a week.

Int. 46. At what hour in the morning does that train leave Boston?

A. Five o'clock.

Int. 47. What instructions did you receive in regard to running No. 123 and No. 124 in said train, while the shoes here produced and marked with a cross were on said cars?

A. I was ordered to put the one that came in behind on one day at the head, so as to reverse the running of the two cars.

Int. 48. What was the object of changing No. 123 to the rear, and then No 124 to the rear every time they came to Boston?

A. As I understood it, it was to give the brake-shoes a fair test over the mountain.

Int. 49. And over the different grades on the Boston and Albany road running east and west?

A. Yes, sir.

Int. 50. Did you attend strictly, every other day, when the train came from Boston, to see that No. 123 was run in the rear, and then also No. 124?

A. Yes, sir.

Int. 51. Did you continue the alternation until the shoes were worn out?

A. Yes, sir.

Int. 52. The shoes having been worn out and removed from the cars in Boston, please state, if you know, the amount of iron consumed by this experiment on No. 123, and the amount of iron consumed on No. 124?

1887 A. On No. 123, there were 80 pounds consumed; on car No. 124, there were 81 pounds consumed.

Int. 53. Did you put a mark upon the shoes worn out upon each car by which you can identify them?

A. Yes, sir.

Int. 54. What mark did you put on the shoes of No. 123, and what mark did you put on the shoes of No. 124?

A. A single cross mark on the face of the shoes of No. 123; and a double cross—two crosses—on the face of the shoes of No. 124.

Int. 55. And do you identify the shoes as produced in connection with each exhibit as the ones which you took off from said cars and weighed the consumption of the metal thereof?

A. Yes, sir.

Int. 56. Did you attend personally to the weighing of the shoes before they were put upon the cars, and after they were removed?

A. Yes, sir.

Int. 57. What was the whole weight when they were put on?

A. Two hundred and thirty-two pounds.

Int. 58. How many days were the cars No. 123 and No. 124 run in M'r Jennings' train to consume the amount of iron stated by you in a previous answer?

A. Between forty-six and forty-eight days.

Int. 59. On what day did the experiment conclude on Jennings' train?

A. March 27th, on No. 124; March 25th, on No. 123.

Int. 60. Why two days' difference in concluding the experiment?

A. M'r Adams hauled the car off for some purpose; I think, to raise it.

Int. 61. And to make the experiment equal, it was run two more days before the shoes were taken off and weighed, is that it?

A. Yes, sir; that was the order.

Int. 62. After this second experiment of weighing the shoes was over, what was done with the brake of No. 123?

A. It was changed into the old Springfield brake.

1888 Int. 63. What parts of the Tanner brake were used in the change, and what discarded?

A. We discarded the equalizer or centre-lever and retained the rest of the work. You can use it all, I take it.

Int. 64. The truck-levers were the same as represented in the exhibit?

A. Yes, sir.

Int. 65. What was added?

A. Two more truck-levers properly connected.

Int. 66. After this change to what extent was the old Springfield brake applied to the cars?

A. It was applied to the whole five—the whole train.

Int. 67. Please state, if you know, how many brake-shoes have been worn out since the whole train was equipped with the old Springfield brake.

A. We have taken off two sets, and have got the third set on. We are running the third set.

Int. 68. How many sets in all have been worn out on cars No. 123 and 124 since about the middle of December?

A. The fifth is running.

Int. 69. After the brake on No. 123 was changed to the old Springfield brake, how much iron did it consume before the shoes were taken off?

A. It consumed eighty-two pounds.

Int. 70. In your judgment, were all the conditions the same, or nearly so, under which "Defendants' Exhibit, large Tanner brake, 123," and "Defendants' Exhibit, large Springfield brake, 124," were tried?

A. Yes, sir.

Int. 71. What complaints, if any, have you heard from brakemen, engineers, or conductors, or from any source, with regard to the operation of the train to which the old Springfield brake was applied?

A. I have not heard any from any engineer or conductor.

Int. 72. What, if any, from brakemen?

A. Sometimes they would speak of their not working very well; the slack wanted taking up, as they do always on any train.

Int. 73. On such complaint did you take up the slack or wear?

1889 A. Yes, sir.

Int. 74. And thereafter did the complaint cease or continue?

A. It ceased.]

Int. 75. With regard to the Hodge brake, which you say is used o the train running on alternate days, do complaints come to you of tha brake as not working effectually sometimes?

A. Yes, sir; of all brakes.

Int. 76. Whether or not there has been any complaint about th chains overlapping each other in the operation of the old Springfiel brake?

A. I don't remember ever having a complaint of that kind.

Int. 77. Can they overlap each other?

A. Not when they are adjusted properly.

Int. 78. Is it your business to keep not only the old Springfield brakes but all other brakes adjusted properly?

A. Yes, sir.

Int. 79. When the old Springfield brake is properly adjusted, or the Tanner brake, do you consider them efficient brakes?

A. Why, yes, I do.

Int. 80. Whether or not any complaint has come to you about either of those brakes not holding on a curve or straight tracks, or when the train was running from a curve to a straight track, or from a straight track to a curve?

A. No, sir.

Int. 81. In your judgment, would there be any difference in any of those brakes named the Hodge, Tanner, or Springfield brake in not holding on a curve, or not holding under the circumstances named in the previous question?

A. No, sir; I do not see why they would not hold as well on a curve as on a straight track.

Cross-examined by complainant, Tho's Sayles:

Cr.-int. 1. How long do shoes usually last on the passenger cars on your road?

1890 A. That depends wholly on the trains they run on. Special trains will wear out shoes very fast. Sometimes you will have to renew them once a fortnight on some of those special trains.

Cr.-int. 2. How long do the shoes last on the train that runs on opposite days to this train you are speaking of in which Nos. 123 and 124 are?

A. I should judge we shoe one as often as we do the other; only probably we do not put them all on at one time.

Cr.-int. 3. That is, you mean that the shoes on the Hodge brake last as long as they do on the Springfield and Tanner brake under the same circumstances?

A. Yes, sir; I have not noticed any difference.

Cr.-int. 4. About what, as a general thing, is the average length of time that shoes run?

A. I don't think, to average them, they would average over a month. I mean on special trains and other trains too they will average about a month.

Cr.-int. 5. How long do they last on the train that runs the same as this does; that is, the train that runs on alternate days, with the Hodge brakes on?

A. I never kept any account of them on any other train but this.

Redirect:

Int. 82. Therefore you do not know, from your own knowledge, how long they do run?

A. I cannot tell exactly how long they do run; I might average it.

Recross:

Cr.-int. 6. You stated that you changed the cars No. 123 and No. 124, or got orders to change them, so as to run one out one way in the rear, and the other in the rear going the other way. Is that the way they ran while they were in M'r Clark's train?

A. No, sir; not in M'r Clark's train.

Cr.-int. 7. Are you usually in the Boston depot when M'r Jennings' train arrives there?

A. I am usually there; and when I am not I have other men there.

1891 Cr.-int. 8. Were you there a week ago to-day when that train came in?

A. I can't state, sir.

Cr.-int. 9. You don't remember whether you were there or not?

A. I can't say; I might have been there and might not. I might have been doing something else.

Cr.-int. 10. Have the brakemen often complained to you when they came in there that those Springfield brakes did not hold good; that they could not stop the train with them, and would run by the stations?

A. I never heard but one man say so to my knowledge.

Cr.-int. 11. Who was that?

A. M'r Gardner.

Cr.-int. 12. When was that?

A. I can't give the date.

Cr.-int. 13. About how long ago?

A. I should judge about a week ago; might have been longer or shorter.

Cr.-int. 14. What part of the train does M'r Gardner run on?

A. The hind end.

Cr.-int. 15. Who is the next brakeman to him?

A. I don't know his name.

Cr.-int. 16. Isn't his name Bartlett?

A. I don't know, sir. I don't know the name of either of the others.

Cr.-int. 17. Did not the brakeman ahead of Gardner make a complaint about one of the cars not holding good, and say that it would run by the stations, at the same time M'r Gardner complained about it, and was not that a week ago to-day, at half past three in the afternoon?

A. I don't remember hearing anybody say anything but Gardner.

Cr.-int. 18. Gardner spoke in reference to cars No.'s 123 and 124 didn't he?

A. He spoke in reference to car No. 123.

Cr.-int. 19. What did he say about it?

1892 A. I can't recollect now what he said I am sure; but something about there being too much slack, or something of that kind. The chains too long is always what they harp on on all trains.

Cr.-int. 20. Did not M'r Gardner make use of these words, namely, pointing to car No. 123: "With these brakes I can't stop the train at all; and we have been running by the stations, and the conductor has been blowing us. This car and that"—pointing to 124—"ought to go into the shop to be fixed; it has been so for three weeks." Did not M'r Gardner make use of about those words?

A. He might have made use of part of them; but I don't think he did, to me, of part. I don't think he mentioned No. 124 car, and I was not aware that he spoke of the cars going into the shop either. I knew he said something about the brakes that day; but I couldn't give any dates.

Cr.-int. 21. Did you ever apply these brakes to the cars, ever work them on the cars?

A. We do, very often, when we repair them. If there is anything out of order, we put it on and try it, to see how it works.

Cr.-int. 22. But never on the road?

A. No, sir.

Cr.-int. 23. You merely apply it on the track where it stands?

A. Yes, sir.

Cr.-int. 24. Are these brakes applied on model 124 the same that they are on those two cars, No. 123 and No. 124?

A. Yes, sir. I should say they were.

Cr.-int. 25. Is the chain running from the windlass and shaft to the first lever, the upper chain or the lower one, in those cars?

A. It is the lower one, I think.

Cr.-int. 26. Is it so on this model, 124?

A. No, sir; I think not.

Redirect:

Int. 83. Would it, in your judgment, in any way affect the operation of the brake, whether the chain leading to the lever nearest the windlass was connected below or above the other chain?

1893 A. Not a particle, if you don't alter the length of your lever.

Int. 84. Is it or not a custom with brakemen to complain, more or less, of brakes of all kinds, in your experience as inspector and repairer of cars?

A. Yes, sir.

Recross:

Cr.-int. 27. Did you know a man by the name of Braman, who was brakeman on that train in which cars No. 123 and 124 were?

A. Yes, sir.

Cr.-int. 28. Did he ever complain to you about the Springfield brakes not working well?

A. Never, to my knowledge.

Redirect:

Int. 84 *a*. Although it is claimed by some that the Springfield brake and the Tanner brake hold a train, when well adjusted, as well, or nearly as well, as the Hodge brake, or the Stevens brake, why are these last-named brakes considered better than either the Springfield or Tanner brake?

A. Because it (the Hodge brake) is self-adjusting, for one thing. The brakeman can adjust it to suit himself. He can set it up partly on one end; and then go and set it up on the other, if the chain is too long. He can pass through the car and set it up on the other end, or jump off and run round.

Int. 85. This he cannot do on the Springfield brake or the Tanner brake?

A. No, sir.

Int. 86. This applies to both the Hodge and Stevens brake?

A. I don't know anything about the Stevens.

Recross:

Cr.-int. 29. With the Springfield brake, after winding it up at one end, so as to apply the brakes, cannot the brakeman go to the other end and apply the brakes harder?

A. I think likely he can.

Cr.-int. 30. Isn't it so with the Tanner brake?

A. Well, you may get some slack; yes, all that is left. Of course, if you don't wind it up, the chain bags down.

1894 Cr.-int. 31. Why, then, do you say that with the Hodge brake the brakeman can adjust it as he chooses—take up part of the chain at one end, and then go to the other end of the car, and take up the balance?

A. Because he can do it. I have done it myself. And there is a very good reason why. If you set the Hodge brake up on one end, it draws all the connections towards the brakeman tight-taut.

Redirect:

Int. 87. Supposing you perform the same operation on the Springfield brake, and the same on the Tanner brake, what will be the result upon the opposite windlass chains?

A. It will make them loose.

Int. 88. Both brakes are alike in that respect?

A. Yes, sir.

BENJAMIN RAY.

Deposition of John A. Smith.

Int. 1. What is your name, residence, age, and occupation?

A. John A. Smith. I am 39 years old; and locomotive-engineer on the Boston and Albany Railroad.

Int. 2. How long have you been such engineer on the Boston and Albany Railroad?

A. Well, since the consolidation of the Boston and Albany. I was employed, previous to that, on the Boston and Worcester Railroad. I have been running an engine about thirteen years.

Int. 3. When does the train that you haul out of Boston leave that place?

A. At five o'clock in the morning.

Int. 4. Who is conductor on that train?

A. M'r William Jennings.

Int. 5. What is the weight of the engine which you use to haul this train?

A. It is about 29 tons.

Int. 6. How much would you add to that for the tender, water, fuel, etc.?

1895 A. I should add about 15 tons.

Int. 7. And that would make, in all, how much?

A. 44 or 45 tons—engine and tender.

Int. 8. To what place do you haul this train?

A. Between Boston and Worcester.

Int. 9. What is the distance?

A. Forty-four miles and a fraction.

Int. 10. What is the average speed which you are obliged to make?

A. The average speed, I should say, would be from 25 to 30 miles an hour.

Int. 11. Do you run it as an express train or accommodation-train?

A. It is put down as an express train between Boston and Framingham, subject to being stopped by flags for passengers going to Palmer and west of Palmer.

Int. 12. You state that you are liable to be flagged at stations between Boston and Framingham. Framingham is about half way between Boston and Worcester, is it not?

A. Yes, sir.

Int. 13. This may take place at any station?

A. Yes, sir; any station and all stations.

Int. 14. What is the western terminus of this train which, you say, leaves Boston at five o'clock in the morning?

A. Albany.

Int. 15. When does that train return?

A. It is due in Boston at 3.30.

Int. 16. Then you have to take out two trains from Boston, one every other morning?

A. Yes, sir; one every other morning. One train goes west one day, and east the next.

Int. 17. In hauling these two trains, which leave Boston at five o'clock, of which William Jennings is conductor, have you or not discovered any difference in the stopping of the trains at the different stations between Boston and Worcester?

A. I have not.

Int. 18. What test do you frequently put the brakes to between Boston and Framingham?

1896 A. Well, when we are flagged up, I whistle for brakes, and the brakemen haul up.

Int. 19. When you are hauled up, have you discovered any difference in the time of hauling you up, one day with another?

A. No, sir, I have not. I usually have, where the sight is good, a particular place where I shut off steam and call for brakes.

Int. 20. Do you have the same sight at all times for calling for brakes?

A. The same sight at the same stations; that is, in clear weather. In foggy weather, perhaps the sight is not so good.

Int. 21. In foggy weather do you change the place of shutting off in calling for brakes?

A. In foggy weather I can't see the signals so quick, sometimes.

Int. 22. Have you been made aware, from any source, that different brakes were run on these two trains on different days?

A. I have.

Int. 23. When, and by whom?

A. I cannot fix the date exactly. It was some time last winter. I was at that time running the train down, and a gentleman came to me in Boston and made inquiries about the brakes—about the way they held.

Int. 24. What did you state to him in reference to the holding?

A. I cannot repeat the words exactly. I stated to him, when I was made aware of the difference, that I saw no difference in the holding of the trains.

Int. 25. How long did he state to you that you had been running the trains in that way, with different brakes on different trains on alternate days?

A. I should say he said a month or six weeks. I can't state positively as to that; but it is my impression that he said they had been on a month or six weeks.

Int. 26. Then I understand that you knew nothing about the
1897 change of brakes on the trains, by the stopping of the same, for five or six weeks, until your attention was called to it by this gentleman?

A. I knew nothing of it until my attention was called to it by this gentleman.

Int. 27. Do you recognize the complainant in this case, M'r Sayles, as the person who informed you of this change of brakes?

A. I should say he was the man.

Cross-examined by the complainant, M'r Sayles:

Cr.-int. 1. About what time last winter was it you saw M'r Sayles in Boston?

A. I can't fix the date, sir, exactly. My opinion would be it was along in March some time. I remember it was a cold and blustering day—or rather a cold day. I should think it was about that time; I can't testify positively; it might vary a few weeks one way or the other.

Cr.-int. 2. Is it a general rule, on your road, to whistle for brakes at stations?

A. No, sir; except in cases like the train that I run. The time card states that that will be stopped by signal from the station for passengers going to Palmer and west of Palmer.

Cr.-int. 3. How long have you run that train?

A. I think about nine years, with the exception of two or three weeks.

Cr.-int. 4. You have run it ever since these Springfield brakes have been on it?

A. Yes, sir; I have run it regularly some seven years. I suppose, of course, that includes the time.

Cr.-int. 5. What are the names of the brakemen who run on that train?

A. I think, at present, the name of the head brakeman is Stevens; and the hind man Gardner, I think. The middle man's name I don't know.

Cr.-int. 6. How long has the middle brakeman been there?

A. I can't tell that. He has been there a number of months; I can't tell how long; time passes off fast. He has been off a while and back again.

1898 Cr.-int. 7. How long have these other brakemen been on the train?

A. I can't tell the time. Stevens has been on for some time; I should say six months or more, perhaps eight or ten. Time passes off fast. I have no means of knowing exactly how long they have any of them been on.

Cr.-int. 8. About how long has the middle brakeman been on there?

A. I can't tell, sir, the time. He was on there, I should say, three or four months, perhaps more; and then was gone for a time, I should think one or two months, and then came back again. He has been back, I should think, two or three months.

Cr.-int. 9. How long has M'r Gardner been on?

A. I can't state positively, sir, the time. He has run the shortest of any of them, I should say.

Cr.-int. 10. Who was the hind brakeman before he came there?

A. I can't call his name. I knew him; I was acquainted with him by sight, and that was all.

Cr.-int. 11. Was he a small man?

A. No, sir; he was a large, stout man.

Cr.-int. 12. Do you know why he left the train?

A. I don't know, sir, why he did. I heard that there was some trouble about being trusteed; I don't know anything about it; it is mere hearsay. He had some trouble. It is nothing that I know much about; it is merely a story I heard. I think his name was Braman.

Cr.-int. 13. You do not see any difference in the stopping of a train, when the Springfield brakes are used on the cars and when the Hodge brake is used?

A. No, sir. As I have stated, the first intimation I had of it was when you spoke to me in Boston in regard to it. That was the first knowledge I had of the change, and since then I have seen no difference in the hauling up of the trains at all.

Cr.-int. 14. Some of your stops are made on curves?

A. Yes, sir; and pretty short curves some of them. There are one or two of them; one in particular is a short curve.

1899 Cr.-int. 15. The Springfield brake seems to work just as well on those curves as the Hodge brake, so far as stopping the cars is concerned?

A. I know no difference. I cannot tell whether I have the Springfield brake or the Hodge brake on; I know no difference in them.

Cr.-int. 16. You make no difference in shutting off the steam, whether you have one brake or the other?

A. None at all. It is something I don't know anything about, or pay any attention to. I don't know which train I have. When I call for brakes I do it at the proper place, where they have a chance to hold me.

Cr.-int. 17. Did you ever examine these brakes on the cars?

A. Not particularly. After my attention was called to it, I looked at the cars and saw how they were arranged. I saw that the Springfield brake was arranged with two chains. I have never examined them particularly.

Cr.-int. 18. Did anybody else ever talk to you about these brakes?

A. After you spoke to me about it, I said something to the conductor one day; that is about all. I think I have heard the baggage-master state that they were put on as a test; that is all. I have had very little conversation with any one about them.

Cr.-int. 19. Did you ever hear anybody on the train complain about the Springfield brake not holding very well?

A. No, sir.

Cr.-int. 20. You are well acquainted with the Hodge brake, I suppose; with the construction of it, I mean.

A. Not particularly. I know the general principle of it. It is something I have never had anything to do with. If I was held well, that was all I required or looked into.

Cr.-int. 21. Do you know anything about the Tanner brakes being on one of those cars?

A. No, sir.

Cr.-int. 22. Did you ever know a brake, such as is represented in the large model, called the Tanner brake, to be on the cars?

1900 A. No, sir; I never noticed or knew anything about it. It may have been on trains that I have run, but I never noticed it.

Redirect:

Int. 28. Please state whether or not some other engineer hauls these trains in from Worcester to Boston?

A. At present there is another man hauls it from Worcester to Boston. Last winter, for about four months, I hauled the train both ways.

Int. 29. Do you know who hauls these trains on alternate days from Springfield to Worcester?

A. It was M'r Hodgkins' train. He hauls it both ways. He brings it from Worcester to Springfield, and from Springfield to Worcester.

JOHN A. SMITH.

Deposition of Luther D. Hodgkins.

Int. 1. What is your name, age, residence, and occupation?

A. Luther D. Hodgkins; 34 years of age; residence, Worcester; occupation, locomotive engineer on the Boston and Albany Railroad.

Int. 2. How long have you been a locomotive engineer?

A. Since July, 1866.

Int. 3. Did you hear the deposition of M'r J. A. Smith?

A. I did, sir.

Int. 4. When he hauls the train named in his deposition, of which M'r William Jennings is conductor, into Worcester, and puts his engine on the side-track, who hooks on to his train to take it here?

A. I do, with my engine.

Int. 5. What is the weight of your engine?

A. It is about 32 tons.

Int. 6. What would you estimate the weight, including the tender, wood, and water?

A. About 47 tons.

1901 Int. 7. What is the speed at which you are required to run these trains, on alternate days, between Worcester and Springfield?

A. The average speed is from 25 to 30 miles an hour.

Int. 8. Are you liable to be flagged, or have you regular stations?

A. We have regular stations. We have only one flag station.

Int. 9. In calling for the brakes at this flag station, have you discovered any difference in the time in which the train is brought to rest, one day with another?

A. Well, I do not have to whistle for brakes but very seldom. At that station there is a board put up, which the brakemen can see as well as myself.

Int. 10. Whenever you do have occasion to stop, then, I will ask you if you have discovered any difference in the time, one day with another, in the stopping of the train?

A. I have not.

Int. 11. Are there any curves on the line of road over which you run upon which stations are located?

A. There are.

Int. 12. At what places?

A. At Warren there is a curve where the depot stands; and at Brimfield the flag station stands on a curve.

Int. 13. In hauling these trains here, day after day, and making stops at all the stations, have you or not discovered any difference in bringing the train to rest at the stations, one day with another?

A. I have not.

Int. 14. Had it ever come to your knowledge, before your attention was called to this matter, that you were hauling a train one day with one kind of brake, and another day with another and a different kind of brake?

A. Yes, sir.

Int. 15. Please state under what circumstances, and when?

A. Some time in the winter we stopped at West Brookfield, and I got off my engine to go back to the depot, and I noticed that the lever on
the forward brake-beam was outside, under the baggage car. I
1902 asked the baggage-master what kind of brake he had there. I
don't know the reply he made, really. I asked him how long the
brake had been on there; and he said they had been running about two weeks, and wanted to know if I had not noticed it before. I told him I had not.

Cross-examined by M'r Sayles:

Cr-int. 1. Did you run any passenger trains while they were using the old single brakes, before they put on the Hodge brake?

A. No, sir; I think not. I don't know for certain. I can't say.

LUTHER D. HODGKINS.

Deposition of Lewis A. Sherts.

Int. 1. Will you please state your name, age, residence, and occupation?

A. My name is Lewis A. Sherts; age, fifty-nine; residence, Springfield; occupation, locomotive engineer on the Boston and Albany Railroad.

Int. 2. How long have you been locomotive engineer on the Boston and Albany Railroad?

A. Twenty-seven years, the 1st of August.

Int. 3. Where, on this road, have you run trains?

A. Well, I have run all along between Worcester and here, and here and Pittsfield.

Int. 4. Where are you running now?

A. Between here and Pittsfield; and have been for the last fourteen years, pretty much all the time, with the exception of a few extra trips east.

Int. 5. What train do you run from here to Pittsfield?

A. The 9.10 train; the middle train.

Int. 6. Who is conductor on that train?

A. John B. Adams.

Int. 7. Who are the brakemen on that train?

A. A man by the name of Taylor is one. I don't know who the other is. We have been shifting them lately.

1903 Int. 8. Do you run the same train every day, or are there two different trains?

A. I run the same train up one day and down the next, making two different trains. The train I run up to-day goes down to-morrow; and the train that I take up to-morrow will go down the next day. We run a different train every day.

Int. 9. Please state if you have observed the fact as to whether there has been any difference in the time in which the brakemen bring your train to rest one day compared with another.

A. I have never noticed any difference in the stopping of either of the trains.

Int. 10. What are the grades on the line of the Boston and Albany road between this place and Pittsfield?

A. From here to Chester it will average about forty-five feet to the mile.

Int. 11. Are the grades heavy on the other side of the mountain?

A. There we have twelve miles on an eighty-three foot grade to go up from here, and six miles of grade to go down on the other side.

Int. 12. What is the weight of the engine by which you haul these trains?

A. Thirty tons.

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Int. 14. What, making a rough estimate, would the tender and all add to the thirty-ton engine?

A. I have never weighed a tender to come at an estimate. The coal

would weigh three tons. I don't know what the water would weigh. Call it five tons.

Int. 15. In passing down on the western slope of the Green Mountains, towards Pittsfield, are almost all your stops made on down grades?

A. We stop at one station, Dalton, going on a down grade.

Int. 16. In running these trains on alternate days between Springfield and Pittsfield, and especially on the down grade at Dalton, have you at any time discovered any difference in the time of stopping the train?

1904 A. I have not.

Int. 17. Have you at any time, and if so, when and by whom, been made aware that the two trains are equipped with different brakes?

A. I am not aware that there are different brakes.

Int. 18. Then, do I understand, that it has never come to your knowledge that one train is equipped with one kind of brake and the other train with another kind?

A. No, sir; I was never notified of that.

Int. 19. It has never come to your knowledge from any source?

A. No, sir.

Cross-examined by M'r Sayles:

Cr.-int. 1. Does not your train sometimes run by the stations?

A. Sometimes it does.

Cr.-int. 2. You don't know what days it runs by most?

A. No.

Cr.-int. 3. You don't keep any account of it?

A. No, sir.

Cr.-int. 4. Do the trains often run by stations?

A. Not often.

Cr.-int. 5. Do they some days more than others?

A. No, I don't know as they do. Yes, sir; some days we will slip by one station a little ways, and the next station we will be stopped right up at it.

Cr.-int. 6. So that you can't tell whether one of these trains runs by more stations than the other?

A. I don't think they do.

Cr.-int. 7. You can't tell whether they do or not, if you keep no account of it, can you?

A. No.

Cr.-int. 8. You stated that they had changed brakemen lately on one of those trains?

A. Yes, sir; we have shifted one of our brakemen off.

Cr.-int. 9. Who was that?

A. Wood went off, and I don't know who took his place.

Cr.-int. 10. Did he run on this train that M'r Adams runs?

1905 A. He run on Adams' train.

Cr.-int. 11. What train is Wood on now?

A. He isn't on the road at present, that I know of.

Cr.-int. 12. How long have you run this train of M'r Adams'?

A. About sixteen or seventeen years.

Cr.-int. 13. You used to run trains, then, when they used the single brake?

A. Yes, sir.

Cr.-int. 14. Did you have any trouble in stopping at stations then?

A. No; the cars were shorter and easier handled than they are now.

Cross-examined by M'r Sayles:

Cr-int. 1. Did you run any passenger trains while they were using the old single brakes, before they put on the Hodge brake?

A. No, sir; I think not. I don't know for certain. I can't say.

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Int. 1. Will you please state your name, age, residence, and occupation?

A. My name is Lewis A. Sherts; age, fifty-nine; residence, Springfield; occupation, locomotive engineer on the Boston and Albany Railroad.

Int. 2. How long have you been locomotive engineer on the Boston and Albany Railroad?

A. Twenty-seven years, the 1st of August.

Int. 3. Where, on this road, have you run trains?

A. Well, I have run all along between Worcester and here, and here and Pittsfield.

Int. 4. Where are you running now?

A. Between here and Pittsfield; and have been for the last fourteen years, pretty much all the time, with the exception of a few extra trips east.

Int. 5. What train do you run from here to Pittsfield?

A. The 9.10 train; the middle train.

Int. 6. Who is conductor on that train?

A. John B. Adams.

Int. 7. Who are the brakemen on that train?

A. A man by the name of Taylor is one. I don't know who the other is. We have been shifting them lately.

1903 Int. 8. Do you run the same train every day, or are there two different trains?

A. I run the same train up one day and down the next, making two different trains. The train I run up to-day goes down to-morrow; and the train that I take up to-morrow will go down the next day. We run a different train every day.

Int. 9. Please state if you have observed the fact as to whether there has been any difference in the time in which the brakemen bring your train to rest one day compared with another.

A. I have never noticed any difference in the stopping of either of the trains.

Int. 10. What are the grades on the line of the Boston and Albany road between this place and Pittsfield?

A. From here to Chester it will average about forty-five feet to the mile.

Int. 11. Are the grades heavy on the other side of the mountain?

A. There we have twelve miles on an eighty-three foot grade to go up from here, and six miles of grade to go down on the other side.

Int. 12. What is the weight of the engine by which you haul these trains?

A. Thirty tons.

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Int. 14. What, making a rough estimate, would the tender and all add to the thirty-ton engine?

A. I have never weighed a tender to come at an estimate. The coal

would weigh three tons. I don't know what the water would weigh. Call it five tons.

Int. 15. In passing down on the western slope of the Green Mountains, towards Pittsfield, are almost all your stops made on down grades?

A. We stop at one station, Dalton, going on a down grade.

Int. 16. In running these trains on alternate days between Springfield and Pittsfield, and especially on the down grade at Dalton, have you at any time discovered any difference in the time of stopping the train?

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Int. 17. Have you at any time, and if so, when and by whom, been made aware that the two trains are equipped with different brakes?

A. I am not aware that there are different brakes.

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A. No, sir; I was never notified of that.

Int. 19. It has never come to your knowledge from any source?

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Cross-examined by M'r Sayles:

Cr.-int. 1. Does not your train sometimes run by the stations?

A. Sometimes it does.

Cr.-int. 2. You don't know what days it runs by most?

A. No.

Cr.-int. 3. You don't keep any account of it?

A. No, sir.

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Cr.-int. 7. You can't tell whether they do or not, if you keep no account of it, can you?

A. No.

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A. Yes, sir; we have shifted one of our brakemen off.

Cr.-int. 9. Who was that?

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Cr.-int. 9. Who was that?

A. Wood went off, and I don't know who took his place.

Cr.-int. 10. Did he run on this train that M'r Adams runs?

1905 A. He run on Adams' train.

Cr.-int. 11. What train is Wood on now?

A. He isn't on the road at present, that I know of.

Cr.-int. 12. How long have you run this train of M'r Adams'?

A. About sixteen or seventeen years.

Cr.-int. 13. You used to run trains, then, when they used the single brake?

A. Yes, sir.

Cr.-int. 14. Did you have any trouble in stopping at stations then?

A. No; the cars were shorter and easier handled than they are now.

Cr.-int. 15. You stopped just as regularly then as you do now?

A. Yes, sir. There wasn't more than half the heft to a train then that we have now.

Cr.-int. 16. How long ago was that?

A. That was when I first commenced to run, sixteen or seventeen years ago.

Cr.-int. 17. How long is it since they put the double brakes on the road between here and Albany?

A. I can't tell how long it is.

Cr.-int. 18. How long is it since they began to put on these heavier cars?

A. They have been increasing them every year; making them larger and heavier.

Cr.-int. 19. Has there been any other brakeman on M'r Adams' train since last January, who has left?

A. I guess this Wood was on at that time. He was on until a month or so ago. I think he is in Worcester. I heard he was there driving a hack. I don't know certain whether he is or not.

Cr.-int. 20. Is he the only one who has left the train?

A. He is the only one who has left, I guess, since January.

Cr.-int. 21. What is Wood's first name?

A. I can't tell you. I can't tell Taylor's given name. I never heard it mentioned, as I know of.

1906 Cr.-int. 22. Couldn't they hold these trains at the stations now with the single brake?

A. It would be pretty difficult to do it. They could not do it without putting on more brakemen. They would have to have a brakeman between every two cars to do it with single brakes now. The speed is greater now than it used to be. We used to be three hours going between here and Pittsfield, and now we are two hours and seventeen minutes.

Cr.-int. 23. You think it would not be safe, then, to run passenger trains, as they run them now, with single brakes?

A. No, sir; not at the speed we run them now, on those heavy grades.

Redirect:

Int. 20. That is, not unless the number of brakemen was increased?

(Plaintiff objected to the question as leading.)

A. Yes, sir; you must increase the number of brakemen.

LEWIS A. SHERTS.

Deposition of Joseph Brown.

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Joseph Brown; residence, Greenbush, N. Y.; age, 46; occupation, locomotive engineer.

Int. 2. How long have you been a locomotive engineer?

A. About fifteen years.

Int. 3. Have you heard the depositions of M'r Smith and M'r Hodgkins?

A. I have.

Int. 4. You will please state if you hook on to the train which leaves Boston for Albany, which is taken from Boston to Worcester by M'r Smith, from Worcester to Springfield by M'r Hodgkins, from here to Pittsfield by M'r Sherts, at Pittsfield.

1907 A. Yes, sir.

Int. 5. To what place do you take it?

A. Albany.

Int. 6. What is the weight of your engine, including the tender, by which you haul that train?

A. I believe the engine is about twenty-eight tons.

Int. 7. How much would you add to that for tender, fuel, water, &c.?

A. About twelve tons, I should think.

Int. 8. Making in all how much?

A. About forty tons.

Int. 9. In hauling this train on alternate days, please state if you have noticed any difference in the time in which the brakemen bring the train to rest at the different stations.

A. I have not. I was not aware that they had any different brakes.

Int. 10. Who is conductor on that train?

A. M'r John B. Adams.

Int. 11. Please state, if you know, who are the brakemen now employed on that train.

A. I know only the name of one, M'r Taylor. I don't know what his first name is.

Int. 12. Do you haul these trains from Albany to Pittsfield?

A. No, sir; not that train.

Int. 13. Who does?

A. I think M'r Teeling. I am not positive about that, but that is my impression.

Cross-examined by M'r Sayles:

Cr.-int. 1. How long have they used double braks on that train?

A. I don't know.

Cr. int. 2. You have run that train, you say, for how many years?

A. I have run it only since the fifth of this month. I have been running freight.

Cr.-int. 3. You never run a passenger train before?

A. Not as a regular thing. I have frequently, at all times, run a trip or more; a week, sometimes, more or less.

1908 Cr.-int. 4. At what time?

A. At different times. In case a passenger engineer was sick, or something, I have sometimes been put on to run their trains, more or less.

Cr.-int. 5. Did you ever run a passenger train that had on it single brakes?

A. I have not paid any attention to the brakes, any way—whether they were single or double, or what they were; therefore I cannot say about that.

Cr.-int. 6. Are some of the stations, where you have run these trains, on curves?

A. Some of them are.

Cr.-int. 7. You do not see any difference in the stopping of the trains on the two different days?

A. I have not been able to discover any, or taken any notice. They all apparently made the stops, as a general thing, alike.

Cr.-int. 8. You shut off steam at the same place on both trains?

A. About the same, according to the speed the train would be under. That made a little difference about shutting off.

JOSEPH BROWN.

Deposition of Cornelius Teeling.

Int. 1. What is your name, age, residence, and occupation?

A. Cornelius Teeling; age, about forty years; residence, Greenbush, N. Y.; occupation, locomotive engineer.

Int. 2. How long have you been so employed?

A. In the neighborhood of 18 or 20 years.

Int. 3. On what road?

A. The Boston and Albany.

Int. 4. Formerly known as the Western road, before the consolidation with the Boston and Worcester?

A. Yes, sir.

Int. 5. Have you heard the evidence of M'r Smith, M'r Hodgkins and M'r Brown?

1909 Yes, sir; pretty much all of it.

Int. 6. Are you acquainted with the time of starting certain trains from Boston, known as the five o'clock train, of which M'r William Jennings is conductor?

A. I am not much posted on the times of leaving Boston and Springfield.

Int. 7. What time do these trains leave Albany to come east?

A. I leave Albany at 6.30, our time—Boston time—and 6.40 from Greenbush.

Int. 8. Are the trains you haul, those taken up by M'r Adams the day before?

A. I think they are. I am not positive.

Int. 9. Who is conductor on the trains which you haul from Albany?

A. Charles Marsh.

Int. 10. Who is the rear brakeman?

A. The head brakeman is M'r Prouty. Charles Chambeau has been acting as middle brakeman; there is a new man on now. I can't tell his name.

Int. 11. Who is the rear brakeman?

A. James Lyon.

Int. 12. What is the weight of the engine with which you haul these trains every other day?

A. From 26 to 28 tons.

Int. 13. What would you add for tender?

A. I should think somewhere betwixt 30 and 32 tons. That includes the whole. Probably it will go a little more. The engine is not very heavy. It is a pretty light engine. It is one of the old class of Mason engines.

Int. 14. Are the cars which make up the trains that leave Albany on alternate days the same or different?

A. I can't say exactly what the numbers of the cars are that we haul every day.

Int. 15. But the numbers would be different? They would not be the same cars?

A. No, sir; I think not.

Int. 16. What is the time between Albany and Pittsfield?

A. The time would be about 25 or 30 miles an hour.

1910 Int. 17. Are any of the stations at which you stop located on curves?

A. Some of them are.

Int. 18. In hauling these two trains on different days, have you or not discovered any difference in stopping?

A. No, sir; I have not, particularly. I don't know that I have discovered any difference. They all make very good stops.

Int. 19. Has or not your attention at any time been called to the fact that there were different brakes on the two trains hauled on alternate days?

A. Only one morning, at Chatham, as I came out from breakfast, I was walking up from the depot to the engine, and the head brakeman spoke to me and said, "You haven't seen this, have you?" Said I, "What is it?" He said, "Well, we have got a double chain on here." I just cast my eye between the tender and baggage-car, and I saw two chains there. That is all I ever knew about it.

Int. 20. How long ago was that?

A. Probably it was a month or six weeks ago.

Int. 21. With the exception of what you have already stated, I understand you were not aware that there were two different kinds of brakes on the two different trains?

A. Not that I know of. I don't recollect.

Int. 22. Please state whether you know what brakes will be on the train that you will probably haul to-morrow morning, at half-past six.

A. No, sir; I do not.

Int. 23. You don't take into account what brakes are used on a particular day?

A. No, sir; no particular notice. I don't look after the brakes much of any.

Int. 24. If there were an inefficient brake put on your train, would you be likely to discover its inefficiency, in bringing the train to rest at the stations?

A. All the way I could tell, if it don't stop, I should ask what the matter was; and they would probably say it was a very poor brake, or something of that sort.

1911 Int. 25. Have any complaints of that kind come to your knowledge?

A. Not very lately, sir.

Cross-examined by M'r Sayles:

Cross-int. 1. You say "not very lately." How lately?

A. I can't exactly tell how long it would be. I can't form any idea exactly when it was.

Cross-int. 2. A month ago, or two months, or a week?

A. I should think it would be longer than that, sir.

Cross-int. 3. You have heard no complaints for the last two months?

A. Not that I know of. I have not heard any complaint that I know of for the last two months. The men have broke me since I run that train very well indeed. I have no fault to find whatever.

Cross-int. 4. How long have you run that train?

A. I think since some time along in December. I can't say exactly how long I have run this train.

Cross-int. 5. There have been no complaints since you run that train?

A. No, sir; the men have broke me up, and broke me up very good indeed. They have stopped me at the stations very well indeed. There have been no complaints whatever, that I know of.

Cross int. 6. How long have you run passenger trains on the road?

A. Well, quite a number of years.

Cross-int. 7. How many?

A. Well, I can't say the number of years I have run them, exactly.

Cross-int. 8. You were running passenger trains while they were using the old single brake?

A. I wouldn't swear positively whether I was or not.

Cross-int. 9. Did you run passenger trains there before 1856?

A. I think not. I think I was running freight in 1856.

Cross-int. 10. About how soon after that did you ever run a passenger train?

1912 A. I don't know, exactly. The first time that I ever took a passenger train steady was the time that the owl train was first put upon the road here.

Cross-int. 11. What year was that?

A. That I can't say exactly.

Cross-int. 12. Did you use to run passenger trains occasionally before?

A. Once in awhile—extra like. I would go on to a passenger train once in awhile.

Cross-int. 13. I mean, before 1856?

A. I can't say whether I did or not before 1856.

Cross-int. 14. What train does this M'r Chambeau run on now?

A. He is in the yard now, a baggage-man on the Albany side.

Cr.-int. 15. How long since he left the train?

A. I should think it was some day last week. Only a short time ago.

Cr.-int. 16. Have the other brakemen been on the train ever since last December?

A. About ever since we run the train. M'r Prouty, when I took the train, was off for a few weeks; but came on again, and has been on the train ever since, except, may be, a day or two.

Cr.-int. 17. Did you see that Tanner brake on the car, when it was on?

A. I don't remember whether I saw that brake or not. I saw something similar to it. I don't know whether that is the kind of brake or not.

Cr.-int. 18. You don't know whether it was that brake called the Tanner brake, that was on the car that was shown to you, or the Springfield brake?

A. I don't know whether it was the Tanner brake, or the Hodge brake, or what brake it was.

Cr.-int. 19. I mean the one to which your attention was called at Chatham?

A. At Chatham, I looked betwixt the tender and baggage-car, and I saw two chains that were fastened to the end of the staff. That 1913 is as far as I looked at it. I did not go back any further. In fact, I didn't pay much attention to it; just merely cast my eye, walked on, got on the engine, and started off.

CORNELIUS TEELING.

Deposition of R. C. Steele.

Int. 1. What is your name, age, residence, and occupation?

A. My name is R. C. Steele; I am 47 years old; reside on Greenwood street, Springfield, Mass., and run a locomotive engine on the Boston & Albany Railroad, between here and Pittsfield.

Int. 2. How long have you run a locomotive on the Boston and Albany Railroad?

A. It is about 20 years. Somewhere in that vicinity. I can't tell exactly.

Int. 3. What can you say in relation to the grades over which you have to haul your train from Springfield to Pittsfield and return?

A. Well, the grades are pretty heavy, part of the way. I can't tell how heavy. After we leave Chester they are very heavy. They are the heaviest grades we have on the road.

Int. 4. What train is it your duty to haul from Pittsfield to Springfield?

A. I come down on Marsh's train, that gets in here at 11.15.

Int. 5. What time does that train leave Boston to go to Albany?

A. I can't tell you what time it would leave there.

Int. 6. What time does that train get here, coming back from Boston?

A. I bring it in from Pittsfield; but what time the cars get in, I don't know. I don't know what train they come back on.

Int. 7. When does the train leave Albany that you haul?

A. I have not looked on the card to see. Somewhere about five o'clock.

Int. 8. What time does it get into Pittsfield?

1914 A. It is due in Pittsfield at 8.52.

Int. 9. Then you take the train in charge?

A. I take the train over here.

Int. 10. Who is conductor on the train?

A. Charles Marsh.

Int. 11. Who is brakeman?

A. The rear-end man is James Lyon; Charles Chambeau is the middle man; the name of the man at the forward end is Prouty.

Int. 12. In hauling your train from Pittsfield to Springfield, do you have to cross the Green Mountain range?

A. Yes, sir.

Int 13. That is, you go up on the western slope of it, and come down on the eastern slope to this place?

A. Yes, sir.

Int. 14. In hauling that train from Pittsfield across those mountains, have you discovered, during the last two or more months, any difference in the time of stopping the train at the stations, from day to day?

A. No; I don't know as I have. There is no more difference than there is every day. I find, in stopping at the different stations, they let me by, or won't let me up to the station; but I don't notice any difference from day to day.

Int. 15. Are they as likely to stop you short as to run by?

A. Yes, sir; just as likely.

Int. 16. But, as a general rule, they try to stop at the stations?

A. Yes, sir. As a general rule, they come up to the stations well. These men are not as good men as you might have, because they don't work together. I don't think there is any fault with the brakes on the cars.

Int. 17. Then, as I understand you, you have not discovered any difference in the stopping of the trains, comparing one day with another?

A. No, sir. I have been told, since I came here to-day, that they are running two kinds of brakes there; but I did not know it before.

1915 Cross-examined by Mr Sayles:

Cr.-int. 1. How long have you run this train?

A. About two years.

Cr.-int. 2. How did you learn that there was a different kind of brake on the train?

A. Well, our rear-end man, Jim Lyon, was telling me out here in the depot, since we came in here, that we have been running two different kinds of brakes on the train, one day one kind, and the next another. That was the first I knew of it.

Cr.-int. 3. Has this M'r Marsh run as conductor on the train that you haul, for a long time?

A. I should think he had been there five or six years, if not more. He has been on there a long while. I can't tell exactly how long.

Cr.-int. 4. Have you ever heard any complaint about the brakes not holding good?

A. I have not; never heard a word said.

Cr.-int. 5. You say the cars often run by the stations?

A. Yes, sir. They would just as soon run by where the train has been running without steam four or five miles, on a down grade, as where it had been running with steam up to the station. I consider it is the fault of the brakemen, in not putting the brakes on. That is the reason why they run by.

Cr.-int. 6. Have they not run by more within the last four or five months than before?

A. I have not noticed any difference, at least. Sometimes I have to whistle for them. I can tell by the speed they are running, when they get near a station, whether they are going to run by or not; and if I think they are going to run by, I whistle for brakes. I think it is more the fault of Jim Lyon than anything else that the train runs by. He has been brakeman on that train for sixteen or seventeen years, and I think he has been a little careless. If I were conductor on the train, I would not have him there more than half an hour. I suppose he has been there so long he thinks he is a fixture there, and it don't make any difference whether he brakes or not.

1916 Cr.-int. 7. Have you ever found fault with him for not braking?

A. Not anything particular. Sometimes I blow him a little when we get into the refreshment room at Chester. He has been there so long, it don't do much good to say anything to him. I have heard the other men on the train say that M'r Marsh had to push him out on the platform, sometimes, to put on his brake.

Cr.-int. 8. M'r Marsh has run this train all the time you have been running on it?

A. Yes, sir; it has been his train. He has been away on a vacation for a week or two, it may be, once or twice.

Cr.-int. 9. Who would run his train while he was on a vacation?

A. Stephen Chapin run his train while he was off, the only time he has been off for any length of time since I have been running the train. I don't recollect anybody else running the train but Chapin and Marsh.

Cr.-int. 10. How many cars are there in this train?

A. We get from five to six. Some days we have six. The usual number is five.

R. C. STEELE.

Deposition of William Jennings.

Int. 1. What is your name, age, residence, and occupation?

A. William Jennings; I was 54 years old the 19th of July; residence, Boston; occupation, conductor on the Boston and Albany Railroad.

Int. 2. How long have you been a conductor on the Boston and Albany Railroad?

A. I guess 26 or 28 years, and I don't know but more.

Int. 3. How were you employed on that road previous to your becoming a conductor?

A. I commenced on the 14th day of May, 1840, as baggage-man, running from here to Boston and back. M'r Parker was the conductor

1917 Int. 4. When did you begin to run as baggage-man from Springfield to Albany ?

A. I think it was something like two years after that before I commenced running through from Boston.

Int. 5. What kind of cars were used in your train for baggage-cars ?

A. Common house cars.

Int. 6. What other name was given to the cars in which you carried baggage ?

A. When I first went there, our cars were like our baggage-cars now; then they built what was called a crate-car—a platform with crates—that you could haul on to the car and run on to the boat at Albany, to save time. All the baggage that crossed the river we had put into crates, to save time; otherwise we had to handle it all over, put it on a barrow, and wheel it to the boat. Our crates stood on the boat nights, and in the morning I used to go through and check my baggage, and put the Boston baggage into the Boston crates and the way baggage into others. They did that to save time, but it was a man-killer to save time; it nearly killed me.

Int. 7. State whether or not you were baggage-man on the crate-cars you have alluded to.

A. Yes, sir. The first crate that was built here was put onto my car, and I always run them, until they abandoned them.

Int. 8. Please state how you operated the brakes on such crate-cars.

A. I had to brake from Albany to Boston, and from Boston to Albany. My business was to brake just as much as the brakeman behind, and I had to do the baggage work, too. They worked the men then altogether different from what they do now.

Int. 9. What kind of brake, if any, was put on the crate cars ?

A. Well, what you call the Springfield brake was put on the crate-car—a double-chain brake, similar to this (referring to "Defendants' Exhibit, large Springfield brake, 124.")

Int. 10. Please state why such brake was put on the crate-car

1918 A. M'r Richard Welch, the man who ran on opposite days to me, was an Irishman. Before these double-chain brakes were put on, he had to run through before getting into Albany, and cut off the engine (that was his work and mine), and let the engine go into the round-house this side of Albany. It was down grade there, and the train all kept together until after we went through the canal bridge, and there the passenger cars were detached from the baggage car, and they would stop in the depot; and we run outside to the wharf, where we could let the platform down and run our cars right onto the boat. One day M'r Welch went off onto the float there with his car—I never happened to—and then they went to work and put on this brake, the same as they had on the tenders.

Int. 11. What have you to say of the operation of this old Springfield brake as applied to the crate cars ?

A. I always claimed it was a great advantage over the single brake. In the first place, if we were going west, we had to be on this end of the car, so as to brake two cars; going east, we would be on the opposite end. With the single brake, if we broke one brake, we only had the next car. After we had attached the old Springfield brake, I could operate on the opposite end from the one that was broken; it would operate on both trucks, but it wouldn't with the single brake. The moment the chain breaks, or the connection breaks, you lose the whole power. [The same as we had to-day. I have come up almost all the way from Boston with two men on. One had two double brakes, one had one double brake (these were the Hodge brakes), and one car behind had no brake at all. That was at the mercy of the Lord, if it broke off.]

(Counsel for plaintiff objected to the portion of the answer enclosed in brackets as immaterial, irresponsive, and volunteer.)

Int. 12. What trains are you now running on the Boston and Albany Railroad?

A. Five in the morning and half-past eleven in the morning,
1919 from here and return. We run two different sets of cars. The
cars I left this morning I get back to-morrow, at half past eleven; the cars I left Saturday morning I get back to-day, at half past eleven. My train stays one night at Albany; the other night at Boston.

Int. 13. What brake is applied to these trains that leave Boston at five o'clock?

A. They have the Hodge brake and the Springfield brake. The Springfield brakes come down to-day.

Int. 14. You have the Hodge brake on the cars of one train and the Springfield brake on the cars of the other train?

A. Yes, sir.

Int. 15. What difference, if any, have you noted in stopping the train on opposite days, from Boston out?

A. I don't know as there is any difference in the brake; there may be a difference in the days. You may take any brake—I don't care what brake it is—and you cannot always make your brake hold the same. It depends altogether upon the rails about the brake; but I do not know that there is any difference between one brake and another, in making stops one day as well as another. I cannot see any difference. I have been 33 years on the road, and have had a good deal of braking up to do myself, too.

Int. 16. Do you recollect there being put into your train a car with a Tanner brake on, a centre lever?

A. Yes, sir; I was shown and told of it at the time.

Int. 17. How long was that run in your train?

A. I cannot say now, exactly. I know I was told by the repair man there that that car wanted to be used, and used square and handsome, like the rest of them. They said they were trying the shoes, or something.

Int. 18. Did you note that car No. 123, with the Tanner brake, was put in the rear of the train every other day?

A. Yes, sir; I have noted it out of Boston.

Int. 19. And the same may be said of No. 124?

A. Yes, sir; there was a change every trip down there.

Int. 20. With what object?

A. To give them a fair test on the grades. I know there is an
1920 object with any brake. I will run one car behind six months and
they will not be even—the two cars won't. Any man of good common sense can go over these hills and tell you so. The hind end man, going down lots of grades, drags his wheels all the way, where the other man don't touch them. It is proper and square and just to change them. There is nothing unfair about it. Every man knows that we set the train by the hind car, coming up to stations; and going down these grades, there are lots of places where we have to haul the cars two or three miles by dragging the brakes.

Int. 21. Please state if, in your judgment as conductor of a train, the old Springfield brake is a safe brake for handling a train.

A. I never saw anything out of the way in it, unless it breaks. Anything is liable to break, you know. But if the brake is in working order, I don't think any man in the world could tell the difference. Put him on the car in the night, when he couldn't see the brake, and I don't think he could tell the difference. There is a difference in the rigging of them; but if he didn't see them, I don't think he would know the difference.

Cross-examined by M'r Cozzens:

Cr.-int. 1. The difference between what brakes do you mean?

A. Either the Tanner or the Hodge.

Cr.-int. 2. How do you know what the object of putting these particular cars, No. 123 and No. 124, in the rear of those trains on alternate days was, except, as you have said, what you have been told by the men? I refer to those particular cars; I am not asking about the object generally of changing rear cars.

A. I think I have stated it fairly enough; I think I have told you the object of it; and, furthermore, I told you the men said they must be changed because they wanted to test the two. That is square enough and fair enough. I have given you the reason why it was done, and why it was ordered to be done. It is a fair test, and it would be fair in no other way.

1921 Cr.-int. 3. What are the names of the brakemen who have broken on this train since the cars with the Springfield brake have been in the train?

A. One of them is named Gardiner. I don't know his first name. He is away now. He has gone to work for the Eastern Railroad, I understand. The names of the other men are Bartlett and Stevens.

Cr.-int. 4. What are their first names?

A. I don't know the first name of either one of those men.

Cr.-int. 5. Who took Gardiner's place when he left?

A. It is hard telling. M'r Bartlett was the middle man, and I put him back; but I have had three or four different men. My men are all mixed up now. One of my brakemen is acting as baggage-master. My baggage-master is off on a furlough, but will be back to-night or tomorrow, and then the man goes to braking again. Bartlett was the middle man, and when Gardiner left I put Bartlett back on the hind end, where Gardiner broke; he has been the hind-end man for the last three or four months. The middle man is any man I can pick up. Sometimes he is a man from a freight train, and sometimes he is a man who has never run on a train anywhere. But I shall be all right in two or three days.

Cr.-int. 6. Do you know the names of all these men you have got to act as middle men?

A. No, sir. The man I have got to-day, I don't know what his name is any more than the farthest man in the world. My regular gang is three brakemen and a baggage-master. M'r Bliss is my baggage-master.

Cr.-int. 7. Then your regular equipment for that train is three brakemen?

A. Yes, sir, and a baggage-master.

Cr.-int. 8. How many cars are the regular equipment of that train?

A. We run out of Boston five cars. Going down, we run never less than five; sometimes six and seven. I sometimes take on cars at Worcester, but not often. Going down we have more than up. I

1922 hardly ever have more than five cars out of Boston; but coming in we sometimes have fifteen or twenty, just as it happens.

Cr.-int. 9. Have you given the names of all the brakemen who have been on this train from the time the car with the Springfield brakes first commenced running in it up to the time when M'r Gardiner left?

A. My impression is that there was a man by the name of Braman there when they were first put on.

Cr.-int. 10. Anybody else?

A. I don't remember any one else.

Cr.-int. 11. About how long was Braman on your train?

A. I think Braman was on there six or eight months, altogether. I can't tell exactly. Braman was on the hind end there for a long time.

Cr.-int. 12. Was Braman a good brakeman?

A. No, sir; he was not—not if I am a judge.

Cr.-int. 13. What was the matter with him?

A. Well, he would get drunk, and you want a man you can depend on. That is what I call a good brakeman.

Cr.-int. 14. What kind of a brake was used on the passenger-cars of what is now the Boston and Albany Railroad, formerly the Western Railroad, prior to the time when what you have called the old Springfield brake was put upon those crate cars?

A. Simply the single brake, which broke on four wheels only.

Cr.-int. 15. Was what you have called the old Springfield brake ever used on any passenger-cars on the Western Railroad before or after the time that it was put on those two crate cars?

A. Yes, sir; but not before to my knowledge. If my memory serves me, that was the first Springfield brake I ever saw on a car.

Cr.-int. 16. You say, not before. If such a brake was put on the passenger-cars of the Western Railroad after it was put on those crate-cars, on how many passenger-cars was it put?

A. I can't tell, sir. That is something I can't remember; but quite a number of them.

1923 Cr.-int. 17. You are sure that it was put on quite a number of passenger-cars, after being put on those crate-cars?

A. I am sure it was put on some of them; but I cannot tell, now, the number.

Cr.-int. 18. How long, after it was put on those two crate cars, was it put on those several passenger-cars?

A. I should not want to swear to that; but my impression is, it was pretty soon after. It could not have been long, I think.

Cr.-int. 19. Was it within a year after, to the best of your recollection?

A. I should say it was; still, I cannot fix any date, because I have no dates nor anything I can refer to. It is something I never laid up, you know.

Cr.-int. 20. Did you, when you answered that question, see M'r Whipple shake his head "No," to you?

A. No, sir; I have not looked at M'r Whipple.

Cr.-int. 21. Do you recollect anything about when the Hodge brake was first adopted on the passenger-cars of the Western Railroad?

A. Well, it was some time after. I couldn't say, sir. I was well acquainted with M'r Hodge. My impression would be, some two or three years; because I know M'r Gray and M'r Hodge had a brake controversy two or three years after the Springfield brake was put on the crate cars. I couldn't fix the time exactly; but I guess I am pretty near right.

Cr.-int. 22. How generally was the Hodge brake adopted on the passenger-cars of the Western Railroad at this time?

A. Well, it was quite a while before they got them on very extensively. They went on rather slow, after the road agreed to take hold of them.

Cr.-int. 23. Do you know whether the Hodge brake was being tested during this time that it was going on your road slowly?

A. I know when they put them on, we used them. I don't know as they were put on the road as a trial. I know we used them the same as any other brake when they were put on. I don't remember of any simple test about it, or any particular thing about it.

1924 Cr.-int. 24. Where did these several passenger-cars of which you have spoken, that had the Springfield brake on, run?

A. It would be pretty hard to tell. It was haphazard. Our cars, in those days, were all mixed up. Except those crate-cars, there were no cars that went through regularly. They might be left at Chatham, Pittsfield, Springfield, or Worcester, and we not see them again for a week.

Cr.-int. 25. More or less of them ran to Albany, did they?

A. Oh, yes.

Cr.-int. 26. How long did they continue to use the Springfield brakes on those several passenger-cars?

A. I don't know; for a long time. I don't remember anything about when they were taken off, or when they were done away with.

Cr.-int. 27. You have said that, to the best of your recollection, those Springfield brakes were put on those passenger-cars within a year after the Springfield brake was put on the crate-cars?

A. I didn't say so. I said they might have been put on within a year, and might have been more. My memory wouldn't tell exactly.

Cr.-int. 28. Do you think they were put on within two years?

A. Well, I should think they were; but not, I guess, generally. In fact, they never were on all of them.

Cr.-int. 29. Speaking of the several passenger-cars to which you have referred as having had the Springfield brake put on them after it was put on the crate cars, is it your best recollection that it was put on to those passenger-cars within two years after it was put on to the crate-cars?

A. I told you that, according to my idea, it was; but still it might not have been. I could not fix any date on that.

Cr.-int. 30. I only ask what is your best recollection.

A. Well, I have told you I couldn't recollect the time.

Cr.-int. 31. What is your best recollection; that it was within about two years?

1925 A. I cannot answer that question. I have answered it two or three times. I have told you it was put on; I can't tell the time. It might have been three months after, or a year and a half, or two years. I did not make any minute of the time.

Redirect:

Int. 22. May it not be that you are mistaken as to its being applied to passenger-cars at all, after being applied to the crate cars?

A. I think not. I think there were some put on. I may be mistaken, but I think there was. I think it was put on one or two of M'r Parker's cars. That is my opinion; but I may be mistaken. As my memory now serves me, they were put in those trains.

Int. 23. Whether the old Springfield brake, as applied to those crate cars, handled the cars as well, considering the state of the art at that time, as the same brake now applied to that train?

(Counsel for plaintiff objected to the question as grossly leading.)

A. I don't know of any difference between them. I never could learn much. I should hate to cuss one and praise the other to-day.

Recross:

Cr.-int. 32. Did you know M'r Ephraim Harris, head blacksmith on the Western road?

A. I used to know him, as being a blacksmith here.

Cr.-int. 33. Did you know that he got up those brakes that were put on those two crate cars?

A. No, sir; I don't remember now.

WILLIAM JENNINGS.

Deposition of John B. Adams.

Int. 1. What is your name, age, residence, and occupation; by whom employed, and how long so employed?

1926 A. John B. Adams; 57 years old; residence, Springfield; conductor upon the Boston & Albany Railroad, and have been for 32 years.

Int. 2. It has been said that a number of years ago two crate or platform cars were put upon the Western Railroad, now Boston & Albany Railroad, and that a new application of brakes was made to said cars. Do you know anything about it? If so, please state what you know, and the circumstances connected with such knowledge.

A. In the early days of the Western Railroad—in latter part of 1842, or fore part of 1843, I judge—we used the single brake; and in switching our cars at the Greenbush Station, when the crates were upon the car, the brakeman could brake only upon one truck; we made what we call a running switch. In one instance a crate or platform car ran through the passenger-house into the dock. Major Whistler, then civil engineer and superintendent, gave orders that no train should be switched at Greenbush without at engine. M'r Gray, then master-mechanic, suggested to M'r Harris, the blacksmith, if he could not attach an application for braking upon both trucks from either end of the car; and such a brake was perfected by Mess'rs Gray and Harris, or some one, and applied to the platform or crate cars, and was continued on those cars so long as they were in use for carrying baggage-crates.

Int. 3. Wherein did the brake applied as you have stated differ from the old single brake in its operation?

A. It differed by having an additional chain on the shaft running to the further truck. It was what is called the old Springfield brake.

Int. 4. Ephraim Harris has testified in this case "that the brakemen and conductor on the cars (crate-cars) found considerable difficulty and fault in the operation of those crate-car brakes," and one difficulty was in winding two chains on one windlass. "They would," he says, "override even so much as to destroy the brake on the car entirely." What have you to say on that point?

A. I have no recollection of knowing or hearing of any complaint of that kind as applied to those brakes on the crate-cars.

1927 Int. 5. Were you conductor on the train in which these crate-cars were used?

A. I was.

Int. 6. M'r Harris further testifies "that the short chain would prevent a car from turning on a curve." Was that so?

A. I think not—never knew of an instance of its preventing a truck from turning.

Int. 7. What about the fault-finding of the brakemen and conductor?

A. I have no recollection of any such fault-finding, other than would apply to any other brake. If the brake was in any way out of order they would complain.

Int. 8. M'r Harris has further testified "that the car had been thrown from the track in consequence of the short chain not allowing the truck to accommodate itself to the curves." What came under your observation on this point?

A. I have no knowledge of any such occurrence.

Int. 9. He has also testified "that this brake, at the time it was put on, was not intended to brake both ends of the car at once." What is your knowledge on this point?

A. It did brake on both trucks from either end of the car.

Int. 10. And he has further testified that "the brakemen considered that they could handle the car better with a single brake." What have you to say on this point?

A. I have no recollection of any such complaint.

Int. 11. And the said Harris has further testified that "this brake never had a trial to prove whether it was better than the single brake, or whether it answered the purpose for which it was designed." What say you to this?

A. I don't know of its ever having had a trial; but it answered the purpose for which it was designed.

Int. 12. What purpose do you understand the brake was to accomplish?

A. To brake on eight wheels from either end of the car at the same time.

Int. 13. Was this brake used to aid in stopping the trains at stations on the line of road over which the train was run?

A. It was.

1928 Int. 14. What was there about these platform crate or cars that made a double brake more desirable on them than on passenger-cars in the same train?

A. A brakeman, if necessary to use both brakes on a passenger-car, could do so by passing through the car while running; but on the crate-car he could not reach both ends of the car without climbing over the crates, which was very hazardous, and it would take a longer time to do it.

Int. 15. To what other cars, if any, about that time was this crate-car brake applied?

A. I think it was applied to one car called the directors' car.

Int. 16. Has the said brake, as applied to the aforesaid crate-cars and directors' car been applied to a train of five cars on the Boston and Albany Railroad?

A. It has.

Int. 17. Please look at "Defendants' Exhibit, Large Springfield Brake, 124," and state whether it correctly represents the brake so applied.

A. I think it is the same.

Int. 18. When was said brake first applied to this train?

A. I think it was some time in last January that the first car appeared in the train, and thereafter all the cars in the train were fitted up with the same brake.

Int. 19. Before a full train was fitted up with this brake was there, to your knowledge, an experiment tried in your train to test the com-

parative merits of two brakes in wearing out iron? If so, what brakes?

A. There was such an experiment; one was the Springfield brake, and the other the Tanner brake.

Int. 20. What suggestion did you make on the day the experiment commenced, that the test might be perfectly fair between the two brakes?

A. That the cars should be changed at every round trip; one car going ahead one day and the other the next.

Int. 21. What was your reason for suggesting the change?

A. The principal reason was inequality of men in braking. In de-
scending grades the car forward of the last car ordinarily gets
1929 more braking than the last car. Therefore we change braking
each alternate day, as the grades are different and longer on the
different sides of the mountain. By this changing I thought each car
would get an equal amount of braking.

Int. 22. From what point and to what point does this train run, and the distance?

A. From Boston to Albany—202 miles.

Int. 23. What part of this 202 miles do you run this train with said Springfield brake on, and from what place?

A. From Springfield to Albany—104 miles.

Int. 24. Do you return with the same cars the same day?

A. No, I do not.

Int. 25. What brake is on the train you take from Springfield to Albany the next succeeding day?

A. The Hodge brake.

Int. 26. What difference, if any, have you discovered in the stopping of the two trains on alternate days at stations, or otherwise, between Springfield and Albany?

A. I think our average stops are better when we have the Springfield brakes than the Hodge brakes.

Int. 27. How do you account for this difference?

A. I think the Springfield brake is better taken care of or kept in better order. I think the Springfield brake is equal to any other brake for handling a train.

Int. 28. In your judgment, has the value of the double brake been overestimated, as compared with the single brake, in supposing that it saves one-half the number of brakemen.

A. I think it has been overestimated. I think I can stop my train with three brakemen and single brakes on a dry rail as quick as I can with a double brake and three brakemen.

Int. 29. Were you from any cause obliged to dispense with a double brake and resort to a single brake, to what extent would you increase the number of brakemen to make your train as safe against accident as it is now with the double brake, all kinds of weather and condition of rails taken into account? Whatever your answer may be, please give a reason for it.

A. I think an increase of one man to a train more than I have
1930 with a double brake. The additional man would have one truck
to brake on, and could assist the other brakemen.

Int. 30. What grades do you run your trains over between Springfield and Pittsfield?

A. I couldn't say. I know the grades are very heavy.

Int. 31. For how many years did the Western Railroad continue to use single brakes after other roads had adopted double brakes?

A. I don't know, but quite a length of time.

Int. 32. To what extent has the speed of passenger-trains been increased since the years 1843 and 1844?

A. The time between Albany and Springfield has been decreased two hours for way-trains; that is to say, in 1843 the time was six and a half hours, and now it is four and a half hours.

Int. 33. To what extent has the weight of cars been increased in that time?

A. The weight of the passenger-cars has nearly or quite doubled, I think.

Int. 34. In your judgment, did the same necessity exist in 1843 for the use of the double brakes that exists at the present time?

A. I think not. Our trains in 1843 comprised only two cars, and occasionally three with the crate car; and always carried two brakemen, and a baggage-man, who broke on his own car.

Int. 35. As the number of cars on your train increased, did you increase the number of brakemen, while you used the single brake?

A. I think not.

Int. 36. Have you increased the number of brakemen since 1843?

A. Not regularly. I have run all this summer with two regular brakemen only. My regular train now is five cars. Occasionally I have an extra car.

Int. 37. Before adopting the double brake on your road, and when you had to depend entirely on the single brake to stop the train, did the engineer have to reverse his engine to prevent the train from running by stations?

1931 A. Not as often as he does now. Our stops at stations were better made then than now, in consequence of the trains being much lighter—the engines and cars lighter and more easily handled.

Int. 38. Are you obliged to stop your train, at any stations between here and Pittsfield, on a down grade? And, if so, name them.

A. We are; at Hinsdale and Dalton.

Int. 39. Have you had any trouble in stopping your trains at those stations with the old Springfield brake; or has the engineer been obliged to reverse his engine to prevent running by these stations?

A. We run by Dalton frequently; I think less with the Springfield brake than any other.

Int. 40. Do you mean by any other the Hodge brake, which is used on your train on alternate days?

A. I do; that is just what I mean.

Int. 41. Is there any reversing of engines in either case?

A. I don't recollect now of an instance of reversing at Dalton. We do not reverse to stop the train at the station often; but when we run by, and the brakemen fail to stop the train at the station, the engineer has to reverse to back up to the station.

Cross-examined by M'r Sayles, complainant:

Cr.-int. 1. Did your train run by Dalton Station yesterday morning; if so, how far by?

A. It did; about the length of the train.

Cr.-int. 2. Which brakes were on that train, the Hodge or the Springfield?

A. I do not know.

Cr.-int. 3. Did the Springfield brakes, that were on the two crate cars in 1843 and 1844, as you have stated, work as well as the Springfield brakes now work on the five cars on your train?

A. I think they did. I know of no reason why they did not. I

never heard of any complaint of the Springfield brake in 1843 and 1844.

1932 Cr.-int. 4. In your 15th direct answer you say that you think that the Springfield brake was applied to one car, called the "directors' car," about the time it was applied to the crate cars; do you know what the number of that car was; and what knowledge have you that it was applied to it about the time the crate-car brakes were applied?

A. I don't know that any car on the railroad had any number at the time inquired about. I don't remember any number of this car. I have a distinct recollection, I think, that the directors' car had the two chains attached to the staff. The car stood in the passenger-station at Greenbush, and was very little used. It would stand there six months, sometimes, without being used. My knowledge of its being put on about that time is my memory. I can't fix upon any definite time at which this brake was put on. It may have been three months, six months, or a year after the crate-car brakes were in use.

Cr.-int. 5. Will you swear that it was within a year after the crate-car brakes were in use?

A. No; I cannot fix any time definitely.

Cr.-int. 6. These brakes went out of use, didn't they?

A. As far as my knowledge goes, when the crate cars went out of use the brake went out of use.

Cr.-int. 7. Do you know how long that brake was used on that directors' car you speak of?

A. I do not.

Cr.-int. 8. You said, in your 37th direct answer, that before adopting the double brake upon the Western Railroad, and when you had to depend entirely on the single brake to stop the train, the engineer did not have to reverse his engine to prevent the train from running by the stations as often as he does now. What do you know about the engineer reversing his engine, or not reversing it, when the single brake was used?

A. I can always tell, as conductor in the car, by the motion of the car, or sudden reaction, when the engineer reverses to stop the train. The stop is more sudden than when the stop is made by the brakes alone.

1933 Cr.-int. 9. How often did the engineer have to reverse his engine to stop at stations, when the single brake was in use upon the Western road?

A. Very rarely to stop at stations.

Cr.-int. 10. How often does he do it now?

A. Not often.

Cr.-int. 11. Do you mean to say that when the single brake was used upon the Western road there was less necessity to reverse the engines to stop at stations than now, when the double brake is used on said road?

A. I say there is no necessity at all of reversing the engines if all the parties do their duty, and the engine-man his. It is where men neglect their duty that we have to reverse in either case.

Cr.-int. 12. (Question repeated.)

A. I say no; there was no more necessity.

Cr.-int. 13. How was the fact; was the engine more frequently reversed to stop the train at stations with the single brake than now with the double brake?

A. I think not. I speak of my own train. I have no knowledge of the stopping of other trains than my own.

Cr.-int. 14. How long is it since single brakes were used on your train?

A. I don't know the exact time; a number of years; I don't recollect how many. I can't state the year.

Cr.-int. 15. Can you tell the time within three or four years?

A. I can't pretend to tell any definite time; quite a number of years.

Cr.-int. 16. How many cars, on an average, run in your train at the present time?

A. Five and six, this summer; five is the usual number.

Cr.-int. 17. For about how long have you been running with five cars as the usual number?

A. I think for most of the time for a year past.

Cr.-int. 18. Previous to a year past, what was the usual number of cars run in your train?

A. I think we have averaged five cars for two or three years past.

Cr.-int. 19. Prior to three years ago, how many cars did you run, usually, in your train?

1934 A. As many as four.

Cr.-int. 20. Can you tell for how long a time, prior to three years ago, your train averaged as many as four cars?

A. I think our train in summer would date back ten or twelve years, or more, with four cars. The train consisted of a baggage-car, second-class car, and two passenger-cars. Some of the passenger-cars with seats for 76 persons, and others going down to 62 seats.

I mean to say, the time has gone back fifteen years from the present, and even more.

Cr.-int. 21. Will you state the names of some of the engineers, who are now living, who ran your train at the time it had single brakes on it?

A. Darius Wood; a man by the name of Adams, don't know his first name; George Whitney.

JNO. B. ADAMS.

Deposition of Charles W. Marsh.

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Charles W. Marsh; age, 43; residence, Albany; occupation, conductor on the Boston and Albany Railroad.

Int. 2. How long have you been conductor on that road?

A. Twenty years.

Int. 3. Between what points do you run on that road?

A. Albany and Springfield.

Int. 4. What time does your train leave Albany?

A. 6.30.

Int. 5. For the last five or six months, have you been running trains out of Albany, on alternate days, having different brakes applied to the same?

A. We have.

Int. 6. What brakes on one train, and what on the other?

A. The brake called the Hodge brake on one train; the old Springfield brake on the other.

1935 Int. 7. In running these trains on opposite days, please state whether or not you have discovered any difference in the stopping of the trains at stations?

A. I do not see that we make any more effort to stop. The trains are stopped exactly with the same brakes and the same men.

Cross-examined by M'r Cozzens:

Cr.-int. 1. Have you noticed where the brakemen begin to apply the brakes in stopping at the stations with either of those trains?

A. I don't know that they use any more effort.

Cr.-int. 2. That is not my question. Have you noticed where they begin to apply the brakes?

A. Generally they begin to use the brake as soon as the engineer shuts off, at the proper distance from the stations to stop the train.

Cr.-int. 3. Will you now answer my question? Have you noticed where the brakemen begin to apply the brakes in stopping at the stations with either of these trains? "Yes" or "No." Whether you have noticed; that is all I ask.

A. I have taken a little notice.

Cr.-int. 4. And having noticed, you say what you do?

A. I do, sir.

CHARLES W. MARSH.

Deposition of W'm W. Stevens.

Int. 1. What is your name, age, residence, and occupation?

A. My name is William W. Stevens; age, 34; residence, No 2 Shawmut Place, Boston; occupation, brakeman on the Boston and Albany Railroad.

Int. 2. On whose train, running on the Boston and Albany road?

A. William Jennings'.

Int. 3. To what point from Boston does that train run?

A. Springfield.

Int. 4. And from thence to what place?

A. To Albany.

1936 Int. 5. You are a brakeman on this train from Boston to Springfield?

A. From Boston to Springfield, and from Springfield to Boston.

Int. 6. Do you take back the same train that you bring in?

A. No, sir; I do not.

Int. 7. Does the train that goes through from Boston to Albany to-day return from Albany to-day or lie over?

A. It lies over in Albany and returns to-morrow.

Int. 8. Then I take it there are two trains sent out on alternate days from Boston?

A. Yes, sir.

Int. 9. What kind of brake do you have on one train, and what kind on the other that run on opposite days?

A. One has the Hodge brake, the other has the Springfield.

Int. 10. Have you, as brakeman, operated those brakes on opposite days from Boston to this place?

A. Yes, sir.

Int. 11. What is your method, as brakeman, as to time and place of applying the brakes to bring the train to rest at the station?

A. I have no particular point that I set at which I brake. I brake by the way the train is going and how fast it is running.

Int. 12. In the absence of any signal, do you put on the Springfield brake any quicker to bring the train to rest, or at any greater distance from the station than the Hodge brake?

A. I don't, if they are rightly adjusted.

Int. 13. How are the brakes running now, and how have they been running for some time past?

A. They have run very well for the last three weeks.

Int. 14. Has there been some time in which they did not operate as well?

A. There has. Here, about four or five weeks ago, they did not work so well as they have for the last three weeks.

Int. 15. Does it happen sometimes that the Hodge brake does not work so well as it does at others?

1937 Yes, sir, it does. The Hodge brake that came on to-day, there is one end of the car that works very bad. In some places we do not use that end of the car so much as we do the other. We use that mostly in making up the train.

Int. 16. What provision is there in the Hodge brake itself for taking up the wear of the shoes, providing it is neglected by the inspector of cars at the station?

A. You can wind up on one end and set the dog, and then brake on the other and take up part of the slack.

Int. 17. Have you any such provision in the old Springfield brake?

A. We use that on both ends.

Int. 18. I understand by that, that the two brakemen can apply the Springfield brake?

A. You may take the Springfield brake, and you may set one brake on one end of the car, and the other brakeman can wind it up on the other end; and, when he has wound upon it two or three times, you can set it up two or three notches more. After he has set the brake, the other brakeman cannot let it off without some one assisting him.

Int. 19. Can the same be said of the Hodge brake?

A. No, sir.

Int. 20. When the brake is set up firmly at one end, can you set it up further at the opposite end?

A. No, sir.

Int. 21. When the Springfield brake is properly taken care of, in your judgment is it a safe brake applied to a whole train?

A. Yes, sir; I think it is.

Int. 22. As the brakes are now running on the train in which the old Springfield brake is used, what difference, if any, in your judgment, would there be in stopping a train with said brakes, and stopping the other train with the Hodge brake, provided there was a sudden sharp call to stop from the engineer?

A. I have not been on that train for the last three days. When I left the train the brakes were in good shape, and I could stop the train with the Springfield brake as quick as I could with the Hodge
1938 brake, and with less work. I can set the Springfield brake
quicker, when it is properly adjusted, the chains in proper shape, than I can the Hodge brake. That is, I can set the Springfield brake easier, with less work, than I can the Hodge brake.

Int. 23. You speak of being off three days; where were you during that time?

A. I was in the baggage-car.

Int. 24. Are you now running as baggage-man on that train?

A. Yes, sir.

Int. 25. Been promoted from brakeman to baggage-master?

A. I am taking the baggage-master's place; he is gone for ten days

Int. 26. Who has operated the brakes in the rear of these two trains until within a few days?

A. Well, they have not had any one on one day, and two days they have had on another man. I don't know his name. He has usually broke on the "Owl" train.

Int. 27. Who is acting as brakeman on the rear of this train, at the present time?

A. M'r Bartlett.

Cross-examined by M'r Cozzens:

Cr.-Int. 1. How long have you been brakeman on Jennings' train?

A. Nine months.

Cr.-int. 2. Had you ever been brakeman on that train before?

A. No, sir.

Cr.-int. 3. You think the Springfield brake is a first-rate brake, do you?

A. I think it works very well, when it is in proper shape.

Cr.-int. 4. Do you think it is as good as the Hodge brake?

A. I think I can stop a train as quick with the Springfield as with the Hodge brake, when properly adjusted, with the same speed.

1939 Cr.-int. 5. When you have taken up the slack, as you have described, with the Hodge brake, by taking a short turn around the windlass shaft, at one end of the car, you cannot brake, can you, except at one end of the car, as long as that arrangement is continued?

A. Why, you set up one end, and then you can go and brake on the other.

Cr.-int. 6. You have to keep on that other end as long as that arrangement continues?

A. Yes, sir.

Cr.-int. 7. You cannot brake only at one end, as long as that arrangement continues?

A. No.

W'M W. STEVENS.

Deposition of John Bartlett.

Int. 1. Please state your name, age, residence and occupation.

A. My name is John Bartlett; age, 25; residence, Boston; occupation, brakeman on the Boston and Albany Railroad.

Int. 2. On what trains?

2. William Jenning's.

Int. 3. The same trains as described by the previous witness?

A. Yes, sir.

Int. 4. On what part of M'r Jennings' train do you act as brakeman at the present time?

A. The rear.

Int. 5. What two cars did you operate upon this morning, in coming in, with the Springfield brake?

A. No. 123 and No. 124.

Int. 6. Which car comes in the rear?

A. No. 123.

Int. 7. Do you find any difficulty now in taking the slack of the train, and holding the train as it ought to be?

1940 A. I find no difficulty now, sir, since I have been on the rear end of the train.

Int. 8. Previous to occupying the position on the rear end of the train, on what part of the train did you act as brakeman?

A. In the middle of the train.

Int. 9. How many brakemen operate this train?

A. Three.

Int. 10. How many cars compose it from Boston to this place?

A. Five cars, sir.

Int. 11. Is it often increased by any other car or cars?

A. No, sir, not coming from Boston this way.

Int. 12. How is it in returning to Boston?

A. Our train has six cars coming east, and sometimes we take seven.

Int. 13. Always five coming west?

A. Yes, sir.

Int. 14. And you always have the Springfield brake one day and the Hodge brake the other?

A. Yes, sir.

Int. 15. In the event of a sudden call from the engineer to stop, by being flagged, or for any other cause, can you bring one train to rest as quick as the other, at the same speed?

A. I think there isn't any difference now; I can't see any difference. I had a trial yesterday with one brake, and this morning with the other.

Int. 16. What advantage, if any, has the Springfield brake over the Hodge brake?

A. Well, I think there is one advantage; you can set the Springfield brake up on both ends of the car, and it will operate on both ends at a time, and on the Hodge it will not. I think that is the advantage.

Int. 17. Wherein is the Hodge brake, in some respects, better than the Springfield brake?

A. Well, with the Hodge brake, if the chain is too long, and you wind
the rod up so that it brings up to the post, by going back to the
1941 rear, and taking up the slack of the chain, will work better than
the other brake. I don't know any other advantage the Hodge
brake has over the Springfield brake. That is the only point I can see
now.

Int. 18. Do you mean by "the post" the brake shaft on which the chain winds?

A. Yes, sir.

Int. 19. Would it or not make any brake inoperative, if the chain was so long as to bring the hook up against the brake-shaft?

A. Yes, sir, it would.

Int. 20. On which car are the chains the longer—on 124 or 123?

A. On 124.

Int. 21. Do you know how long the chains are on 123?

A. No, sir; I don't know the exact length.

Int. 22. All the brakes on the train in which the Springfield brake is used have two chains winding on each windlass?

A. Yes, sir.

Int. 23. Does "Defendants' Exhibit, large Springfield brake, 124," appear to be the same as you are using on the train which you came in on this morning?

A. Yes, sir; that is the same.

Cross-examined by M'r Cozzens:

Cr.-int. 1. When did you commence to be brakeman on M'r Jennings' train?

A. The first of last November.

Cr.-int. 2. Had you ever been brakeman on that train before that time?

A. No, sir.

JOHN BARTLETT.

Deposition of Henry F. Taylor.

Int. 1. What is your name, age, residence and occupation?

A. Henry F. Taylor; 26 years old; reside in Springfield, Mass.; by occupation, brakeman.

1942 Int. 2. How long have you been brakeman; and upon what railroad and upon what train?

A. I have been brakeman nearly five years, upon the Boston and Albany Railroad, on Conductor John B. Adams' train.

Int. 3. When does his train leave Springfield, and to what place does it run, and when does it return to Springfield?

A. It leaves Springfield at 9.10 a. m., runs to Albany and returns, reaching Springfield at 7.30 p. m., same day.

Int. 4. What brakes are in general use upon the passenger-cars of the Boston and Albany Railroad?

A. The Hodge brake.

Int. 5. What other brake or brakes, if any, have been used on the train upon which you are brakeman?

A. There is a brake used called the Springfield brake, and also a Tanner brake.

Int. 6. On what car did you first see and use the Springfield brake, and on what car the Tanner brake?

A. Passenger-car No. 124, the Springfield brake; and No. 123, the Tanner brake.

Int. 7. About what time did the two cars named, with the aforesaid brakes thereon, come into Conductor Adams' train?

A. I think along about the last of January, the 29th or 30th, 1872.

Int. 8. Were these cars with the aforesaid brakes on, coupled the one to the other? If so, in what part of the train did they run, and who operated the brakes?

A. They were so coupled in the rear of the train—the two rear cars. I operated the brakes myself.

Int. 9. What change, if any, was there made in running cars Nos. 123 and 124, from the time they came into Conductor Adams' train, for six or eight weeks thereafter?

A. The Springfield brake would be behind one trip, and the Tanner the next; and so continue to alternate during the time stated.

Int. 10. How often did you work the two brakes, and from what point to what point did you work them?

A. I worked them at every regular station, and whenever called on to work them.

1943 Int. 11. During the time you worked the aforesaid brakes, did you apply one as strongly and efficiently as the other.

A. Just about the same.

Int. 12. So far as the holding of the brakes on their respective cars, what conclusion did you come to as to the comparative holding-power of the two brakes?

A. I didn't notice much difference, except that one seemed to work a little stiffer than the other. I think the Tanner worked a little stiffer than the Springfield.

Int. 13. What do you mean by one's working a little stiffer than the other?

A. I don't think I could apply the Tanner brake as quick as the Springfield. What I mean by that is, that I think I could take the slack of the train a little quicker with the Springfield than the Tanner brake.

Int. 14. You say you think the Tanner brake works a little stiffer than the Springfield. Do you mean by that that it feels more rigid in applying power to the brakes?

A. Yes, sir,

Int. 15. What brake is now in use on car No. 123?

A. The Springfield brake.

Int. 16. Have you noticed whether there is any difference in length of chains on No. 123 as compared with 124?

A. I have never noticed it.

Int. 17. In operating the old Springfield brake on No. 123, have you noticed that, when the wear of the brake was not taken up, the rods, in applying the brake, came up solid against the windlass-shaft upon which the chains are wound?

(Objected to.)

A. I have noticed when the shoes are worn that the connection-rods come up close against the brake-staff, and we run by the station. This has been the case a number of times. What I mean by that is, that the connection-rod came up against the shaft so as to shut off the power from the wheels.

Int. 18. When the wear of the shoes is properly taken up on the Springfield brake, how many times can you wind the chains around the windlass-staff before the brakes are firmly set?

1944 A. I couldn't say exactly, but I should say about four times; three or four times.

Int. 19. How many to set the Hodge brake?

A. I should say four times to that.

Int. 20. How many to the Tanner brake?

A. I have not noticed much difference, perhaps not as many; but I should say there was not much difference.

Int. 21. What days in the week does the train having the Springfield brake on run from Springfield to Albany? And what days the Hodge brake?

A. I think the Hodge brake runs Mondays, Wednesdays, and Fridays; the Springfield the other days.

Int. 22. Do you operate the brakes on the rear cars of the two trains, on alternate days, between Springfield and Albany?

A. I do.

Int. 23. What has been your observation as to the time of stopping the two trains at stations on alternate days?

A. I don't think we stop quite so quick with the Springfield as the Hodge brake. I don't have to use so much strength to stop the train with the Hodge as with the Springfield brake.

Int. 24. Do you, as a general rule, make what would be called good stops one day with another, without reference to which of the two brakes you have on the train?

A. I think we make better stops one day than another.

Int. 25. May this happen or not on any day?

A. We get by the station many times with the Hodge brake. We have run clear by West Springfield with the Hodge brake. What I mean by running by is, that the baggage has had to be carried two rods to be put into the car from the point where the train ought to have stopped.

Int. 26. Do you with the Hodge brake run by at Dalton so as to have to back up the train?

A. Yes, sir. We got by there about a week ago, and had to back the train up.

Int. 27. What reason can you assign for running by that station on any day?

1945 A. I think sometimes the engineer has something to do about stopping the train. M'r Sherts is our engineer; and he sometimes runs clear up to a station before he shuts off steam, and don't give us a chance.

Int. 28. Are you acquainted with M'r Sayles, the complainant in this case; if so, when did you first make his acquaintance?

A. I know M'r Sayles. I made his acquaintance about two weeks ago.

Int. 29. At that time, what did he wish to learn from you, and what reply did you make?

A. He asked me if I knew where Ed. Wood was. I told him I heard he was in Worcester. He then asked me if he didn't use to brake on the train with me. I told him yes. He then asked me if he was a good brakeman. I said he was. He then asked me how I liked the new brake we were using—the double-chain brake. I told him I didn't think so much of it as I did of the Hodge brake; that I thought the Hodge brake was a better brake—that is, it worked better.

Int. 30. After the interview, when did M'r Sayles meet you again; and what did he want then?

A. He met me the next night, on the arrival of my train from the West. He asked me if I was called on as a witness, would I say I liked the Hodge brake the best. I told him I would.

Int. 31. When, thereafter, did he again meet you; where, and what further did he want of you?

A. He met me the next morning at my boarding-place—Cooley's restaurant—and wanted to know if I would keep track of the number of times we got by stations that day, if we did get by. I told him I would.

Int. 32. Did you get by; and, if so, how many times?

A. The next time I saw him I told him I didn't recollect of getting by any station that day. We had on the Springfield brake that morning.

Int. 33. Thereafter when did M'r Sayles meet you; and where, and what did he want?

A. I think it was at my father's house, at Westfield, some ten miles from Springfield, on Sunday, a week ago last Sunday. He then 1946 asked me where this Mallory was who used to brake with me. I told him he lived up about four miles from there. He wanted to know if he knew anything about the Springfield brake; if they were using it when he was on. I told him, No, he wouldn't know anything about it; for we were not using it at the time. I don't think of anything more at that time. I told him I was coming to Springfield on the early train Monday morning, and he could see me there.

Int. 34. Did M'r Sayles make any inquiries of you about the Springfield brake, at your father's house in Westfield, or ask you to make any statements, or give any evidence in relation to it?

A. I think he did. He wanted to know if I would testify in court, if I should be called on, about running by stations with the Springfield brake. I told him I would. I told him that perhaps the company might not like to have me speak my mind about the brakes; that I might possibly do something and be discharged. He then said that he didn't think they would do any such thing; but, if they did, that I should have a better situation than I held now; but he didn't think they would. He told me that all the time I was out of work, if I should be discharged, that he would pay me as much or more than I was getting now, and see that I had a better situation.

Int. 35. In short, what did he want you to testify to about the old Springfield brake?

A. He wanted to have me say the brake was not as good as the Hodge brake. I told him a great many times that the Springfield brake wasn't adjusted, or fixed, as it should be; that when the shoes got worn thin, they didn't work well, so that we couldn't hold the train. I then said that when the rod came up against the staff, it didn't work well, of course.

Int. 36. Has or not M'r Sayles wished you to testify that the Springfield brake is a very poor brake, unreliable and unsafe to run a train with?

(Objected to.)

1947 A. He asked me if I was willing to testify to the facts that I knew about the brake just as I knew them. I told him yes. I then told him that, if the brakes were in good repair and the shoes not worn, the train could be stopped by using more strength; but couldn't be stopped so easy, and not quite so quick. I then told him there were quite a number of cars with the Hodge brake on, where the brake beams were not hung right; they being either too high or too low, so that they didn't hold any better than the Springfield brake.

Int. 37. Did or not M'r Sayles convey to you the idea that he wanted you to testify that the Springfield brake was unreliable and an unsafe brake?

A. I think he did.

Int. 38. You will now please state whether, in your judgment, the Springfield brake, when properly adjusted, and the wear of the shoes properly taken up, is a safe brake with which to run a railroad train?

A. There would be no more trouble about stopping a train, by using more strength, with the Springfield brake than the Hodge. It is harder for the brakeman. I don't see any difference now in stopping the two trains, one with the Hodge and one with the Springfield, now that we have three men. We have been running with two.

Int. 39. Please state whether, in the operation of the old Springfield brake, you have known of the two chains overriding or overlapping each other on the brake shaft?

A. No, sir; I never have.

Int. 40. Have you or not observed any difference in the holding of cars, by said brake, when the train is running upon a curve or upon a straight track?

A. I have never noticed any difference.

Cross-examination by complainant:

Cr.-int. 1. Did M'r Sayles, when he saw you, several times, some days ago, as you have stated, tell you, that, if you was called upon to testify in this case, that all he wanted was the facts in the case, just as you had stated them to him, with regard to the working of the old Springfield brake?

1948 (Objected to, as it does not fully appear in the record what facts the witness was made to state in reference to the matter inquired of.)

A. I told M'r Sayles I would testify to the facts just as I had told them to him. M'r Sayles said to me, "That is all I want."

Cr.-int. 2. Did he, at any time, ask you to testify to anything in this case that you had not told him was true?

A. No, sir.

Cr.-int. 3. You have stated that the Springfield brake worked harder than the Hodge brake; did you tell M'r Sayles that, when you had the Springfield brake on your trains, you were obliged to commence applying the brakes, in order to stop at the stations, about twice as far from the station as when you had the Hodge brake on?

A. I told M'r Sayles I generally had to commence putting on the brakes farther back, when I had the Springfield brake, than the Hodge brake. I am obliged to, to stop at the station. I mean that I had a green man on who didn't understand the grades, and had to commence sooner. He was also on when we used the Hodge brake.

Cr.-int. 4. Did one of the engineers that hauled your train between here and Albany ask you at any time why you didn't hold the train one day as well as another.—that he had noticed every other day they made better stops at stations than on alternate days?

A. M'r Gettes, who did run from Pittsfield to Albany on this train, asked me why it was that we used to drag into some of the stations so. I said because we have to commence to brake sooner with the brake we are using to-day; that it don't hold as well as the brake we shall have to-morrow. He said, "Don't commence quite so soon, and I will help you—I will throw it over."

Cr.-int. 5. Did he help you stop after that, by reversing his engine when you had the Springfield brake on your train?

A. He would sometimes; but there were flag-stations along on
1949 the road, and it wasn't always that I knew he was going to stop
at such and such stations. At U. Edwards station, for instance,
I could not sometimes see M'r Adams make a motion to stop; and it is impossible sometimes going around curve for the brakeman to see the signal; then, of course, we run by, and then the engineer has to help us. It was not often that I failed to see the signal.

(All after the words "He would sometimes," in the above answer, was objected to by complainant, as drawn out by the remarks of the defendant. Objection objected to, as not stating the matter correctly.)

Cr.-int. 6. Did you not, a few weeks ago, while going from here to Albany with the train having the Springfield brake on, run the whole length of the train by the station at East Chatham, when Superintendent Russell was aboard the train, and did you not tell M'r Russell that you had commenced braking way back by the "grave-yard," and was unable to stop the train at the station with those brakes?

A. I told M'r Russell that I didn't know what was the matter with those brakes. He made no reply. After I got to Chatham, I told M'r Adams that I was sorry to make such a stop as we made at East Chatham; and both of us got down and looked under the cars. I saw the shoes were worn very thin, and the connection-rod come clear up to the staff. I stepped to the rear of the car and turned up the brake, to see if I could take up a little of the slack. I saw it did no good in the stopping of the car. When I got to Albany, I told the train men there, that, before that car went back, they would have to take up considerable of the chain, or fix it in some way, as it wouldn't work.

(The above answer was objected to as not responsive to the question, and the witness then resumed.)

We did not, at the time mentioned, run the whole length of the train by said station; we run about one car's length too far. I told M'r Russell that I had commenced braking way back by the "grave-

1950 yard.” I think I did not tell him I was unable to stop the train at the station with these brakes; but I told him I did not like those brakes as well as I did the other kind.

Cr.-int. 7. What other kind did you mean?

A. I meant the kind that were on the other train, the Hodge brake; but I did not know they were the Hodge brake then.

Cr.-int. 8. Have not you, and the other brakemen that have run on the same train with you, often complained of this old Springfield brake between yourselves, about its working so hard?

A. We have. They work hard.

Cr.-int. 9. Have you not often dreaded getting on the train with the Springfield brake, on account of its working so hard, when your hand was very sore from working so hard on the said Springfield brake?

A. I can't say I dreaded that any more than any other brake when my hand was sore.

Cr.-int. 10. Did you tell M'r Sayles that your hand had become very sore from being obliged to work so hard to stop the train with the Springfield brake?

A. No, sir; I never told him so. I did tell him I never had such looking hands as that, before I used the Springfield brake; that I had to pull a great deal harder with this brake. I never wear gloves.

Cr.-int. 11. What was the condition of your hand when you showed it to M'r Sayles?

A. It was calloused, but no sores were on it. The callous was 1¼ inch wide, and 2 inches long; but it don't trouble me any.

Cr.-int. 12. You say you did not dread the Springfield brake more than any other brake; and you have also said that you had to work a great deal harder with that than with the Hodge brake. Please explain this matter.

A. I don't know as I ever got on a train when I dreaded anything about the brakes. Still, I know the Springfield brake worked harder than the Hodge.

Cr.-int. 13. Did you ever complain to M'r Adams, the conductor of your train, about the Springfield brake working hard?

1951 A. I have told M'r Adams that they worked harder than the Hodge brake.

HENRY F. TAYLOR.

Deposition of Charles Haradon.

Int. 1. What is your name, age, residence, and occupation?

A. Charles Haradon; age, 23; residence, Springfield; occupation, brakeman on the Boston and Albany Railroad.

Int. 2. How long, in all, have you been brakeman on the Boston and Albany Railroad?

A. Three years, last May.

Int. 3. On what passenger-trains have you run as brakeman, during that time?

A. On M'r Clark's train, east, and M'r Adams' train, at present, west.

Int. 4. Were you acting as brakeman on M'r John Clark's train, last fall and winter?

A. Yes, sir.

Int. 5. While acting as brakeman on his train, did cars No. 123 and No. 124 come into that train for service?

A. Yes, sir.

Int. 6. About what time?

A. About December, I think.

Int. 7. On what part of the train were those two cars used?

A. The rear.

Int. 8. And did you operate those two rear cars as brakeman?

A. I did.

Int. 9. Please look at "Defendants' Exhibit, Large Tanner Brake, 123," and state whether that brake, or one like it, was in use on car No. 123, in that train?

A. I should say it was.

1952 Int. 10. You will now look at "Defendants' Exhibit, Large Springfield Brake, 124," and state whether that car had such a brake in use on it while you operated it as brakeman in Clark's train.

A. I should say it did. I had a double chain, at any rate.

Int. 11. At what time did M'r Clark's train leave Springfield?

A. At quarter past seven, in the morning; leaving Boston at three, in the afternoon.

Int. 12. What orders did you receive in regard to the disposal of the two cars, 123 and 124, at Boston, for Springfield?

A. I was ordered to send one of the cars up on the accommodation train; M'r Clark said I could send up which one I chose; the other we kept until three o'clock, for the rear end of the express-train.

Int. 13. Which went on the end of the express train?

A. No. 124.

Int. 14. And which on the accommodation?

A. No. 123.

Int. 15. Why did you send 123 up on the accommodation, instead of 124?

A. Because, in switching the train at Worcester, 124 would in that way come behind always.

Int. 16. Why did you wish to have 124 come behind, instead of 123?

A. That was my preference, because it was always customary to get the easiest and best brake behind, as far as I knew how.

Int. 17. Why did you put 123 onto another brakeman to come up with on the accommodation train, instead of 124?

A. On the principle always to look out for No. 1, I suppose. I had the choice as to which I should have, and I never knew he had anything to say about it.

Int. 18. So you took 124 to come up on the express, and gave to another brakeman 123, to come up on the accommodation?

A. Yes, sir.

Int. 19. How long, as near as you can recollect, did you operate the two cars as brakeman, in Clark's train?

1953 A. I can't say just how long, for I don't remember. I know I had them for a while, and they were taken away. Might have been a couple of months or more, or not so much, exactly; I don't know.

Int. 20. Which brake, in your judgment, having handled both, seemed to be the more effective in taking hold of the wheels of the car to which it was attached, in the work of bringing it to rest?

A. No. 124 always seemed to work the freest and take hold the best, with the least power.

Int. 21. I suppose they were both good brakes, so far as holding the car to which they were applied, respectively, was concerned?

A. Either would hold the train.

Int. 22. There would be no difficulty, I take it, in taking the slack of the train with either in the rear?

A. Yes, either would take the slack of the train.

Int. 23. You say you ran No. 124 from Boston to Springfield in the rear; which did you run in the rear from Springfield to Worcester, and thence to Boston?

A. No. 123.

Int. 24. And those two cars always ran in the rear of Clark's train?

A. Yes, sir; unless we had extra cars. Sometimes we put an extra car behind; very seldom, though.

Int. 25. You speak of being brakeman on M'r Adams' train; when did you commence as said brakeman?

A. The third day of June.

Int. 26. To what point does M'r Adams' train run from this place?

A. To Albany.

Int. 27. When you came on to his train as brakeman, what brakes did you find on the trains running on alternate days from Boston here, and from here to Albany?

A. I found the double chain brakes running one day; and Hodge's brake, so called, running the other.

Int. 28. What other name have you heard the double chain brake called besides that name?

A. The old Springfield brake.

1954 Int. 29. Had you gone out on the train this morning to Albany as usual, what brake would you have had to rely upon to hold the train, as far as you had anything to do with it?

A. I should have had the old Springfield brake.

Int. 30. And on next Monday morning, what will you have?

A. Hodge's brake, so called.

Int. 31. Please state with what success you have met, one day with another, in stopping these trains at the several stations on the line between here and Albany.

A. As good success as ordinarily with any brake.

Int. 32. Do you operate the brakes on the train as rear or forward brakeman?

A. Forward brakeman.

Int. 33. How many cars compose this train all Springfield brakes?

A. There are only four in use. There were five cars in the train. I believe they all had the old Springfield brake.

Int. 34. How many brakemen on that train between here and Albany?

A. Two.

Int. 35. Do I infer, then, correctly, that the train is controlled by the brakes on four cars, although five may be equipped with brakes?

A. Yes.

Int. 36. Who operates the two cars in the rear of the train?

A. Henry Taylor.

Int. 37. And you the two cars next to his, I take it?

A. Yes.

Int. 38. Have you operated the brakes on No. 123 and No. 124 since you became brakeman in M'r Adams' train?

A. No. 124, I have.

Int. 39. How does it work, compared with the working of it when in M'r Clark's train?

A. I can see no difference.

Int. 40. When properly adjusted, and the wear taken up, do you deem the Springfield brake a safe brake on which to depend to control a whole train of cars, with a proper number of brakemen, such as are given to double brakes?

1955 A. Yes, sir.

Int. 41. In the use of the Hodge brake, what method have you, in the brake itself, for taking up the wear of the shoes, providing it is neglected by the proper person to take up such wear or slack?

A. We can take a short turn on the chain on the opposite end of the car from the one on which we are braking, and set down the dog in the ratchet and hold it there.

Int. 42. And then what do you do?

A. Then I go to the opposite end and use it the same as though it were adjusted by the man at the shop.

Int. 43. Do you find that same protection against excessive wear of the shoes in either the Tanner brake or the old Springfield brake?

A. No.

Int. 44. If the wear is not taken up, then, properly, at the shop, you have to go with it until such time as it is taken up?

A. Yes, sir.

Int. 45. What effect would either of those brakes, the Tanner or the Springfield, have on applying power to the wheels, if the chain become so slack as to wind up on the windlass to the hook, and become solid before the power from the windlass reached the wheels?

A. The train would be very likely to run a good ways before it stopped, and run by the stations.

Int. 46. But if such a thing should happen on the road with the Hodge brake, you could take up the wear on the opposite end?

A. Yes, sir.

Cross-examined by M'r Cozzens:

Cr.-int. 1. As to holding the train, do you consider the Springfield brake as good as the Hodge brake?

A. No, sir; I don't.

Cr.-int. 2. Did you see M'r Whipple nod his head "No," before you made this last answer?

A. No, sir; I did not.

Cr.-int. 3. Sure? Didn't you see him shake his head, "No?"

1956 A. I did not; I was not looking at him.

Cr.-int. 4. You have stated above that you had as good success with these trains, one day with another, one of which had the Hodge brake and the other the Springfield brake, as with any brake. What do you mean by that answer, if you consider the Springfield brake not so good as the Hodge brake?

A. Well, there is such a thing as having two different brakes that are not just alike, and still stopping the train with them, and stopping it at the same place. One works easier than the other; does not require so much power or so much caution in using.

Cr.-int. 5. Why did you say you had as much success, one day with another, as with any brake, ordinarily, if you consider that there is a difference between the Springfield and the Hodge, as to holding the cars?

A. Well, I knew each day what sort of brake I had to use, and made allowances accordingly.

Cr.-int. 6. When the days came when you knew you had the Springfield brake, what allowance did you make for that?

A. I knew I had got to work harder, perhaps, to effect the same result.

Cr.-int. 7. "Perhaps." Don't you know it? Recollect, you are on our oath. Don't you know it? Don't you have to work harder, almost every time you stop a train with it? Think before you answer, and answer categorically.

A. I said that I considered the Hodge brake the best, because it worked the easiest.

Cr.-int. 8. That is not the question. Answer the question put to you. (Question repeated.) Now answer the question I ask, and not some question which I don't ask.

A. Yes, sir.

Redirect:

Int. 47. Did you have any different points at which to apply the brakes to stop the train at the stations one day from those you had on another, or did you have the same point of applying it on both days, at any station?

1957 A. I do not brake by marks. I brake according to the speed the train is running, with any brake.

Int. 48. Does the engineer give a signal for brakes; and, if so, what is the signal, before he reaches a station at which he wishes to stop?

A. I know of no signal from the engine for applying the brakes, unless the engineer wishes to stop immediately, which is one short whistle for brakes. The orders of the road require that it should not be used at a station, unless in danger of running by or over something.

Int. 49. Are you governed by the shutting off steam by the engineer?

A. No, sir.

Int. 50. Do you ever apply the brake before he shuts off steam?

A. No, sir; not if I know that he has not shut it off.

Int. 51. How much quicker could you bring the train to rest with the old Springfield brake than with the Hodge brake, or with the Hodge brake than with the Springfield, at a sudden call from the engine?

A. I never have timed it, nor had any occasion for knowing as to that.

Int. 52. What is your judgment?

(Counsel for plaintiff objected.)

A. I should prefer the Hodge brake to stop a train with, on a sudden call, if I was braking against time.

Int. 53. Were you braking against time, which would you prefer under these circumstances, the old Tanner brake or the old Springfield brake?

(Counsel for plaintiff objected.)

A. The old Springfield brake.

CHARLES HARADON.

Deposition of James Lyon.

Int. 1. Please state your name, age, residence, and occupation?

1958 A. My name is James Lyon; age, 58; residence, No. 658 Broadway, Albany; occupation, brakeman on the Boston & Albany Railroad.

Int. 2. How long have you been brakeman on that road?

A. Twenty-five years come September 13th.

Int. 3. On what train are you brakeman?

A. I am now braking on M'r Marsh's train, formerly run by M'r Chapin.

Int. 4. Who hauls that train as engineer from Albany?

A. Cornelius Teeling.

Int. 5. Does he take out the same train every day, or a different train every other day?

A. A different train every other day.

Int. 6. What brakes do you have on these trains?

A. One day we have what is called the Hodge brake; and the next day we have a brake—I don't know what name you would give it, but it is a different brake.

Int. 7. What do you know about it?

A. It has two chains winding on each brake-staff.

Int. 8. How long has this brake been on that train, with two chains winding on each brake-staff?

A. Well, I don't know but you have got me now.

Int. 9. About how long?

A. I should think, about six months; perhaps longer than that.

Int. 10. Have you operated it all that time?

A. Yes, sir.

Int. 11. On what part of the train?

A. On the hind end of the train—between the two last cars.

Int. 12. What numbers are the cars that you operate it on?

A. No. 123 and No. 124.

Int. 13. What can you say of the operation of the two-chain brake, compared with the Hodge brake, which is attached to the train running on alternate days?

A. Well, sir, I cannot see any difference in stopping the train, between one and the other. I do not know that I work any harder with one than the other.

1959 Cross-examined by M'r Cozzens:

Cr.-int. 1. One is just as good as the other?

A. We stop the train just as easy. I am sure I don't work any harder with one than with the other. I have sometimes thought I had a little the easiest job when I had the two-chain brake on.

JAMES LYON.

DEPOSITIONS OF JOHN MULLIGAN, HENRY H. SNOW, WILSON EDDY AND EMERY STEBBINS.

Deposition of John Mulligan.

My name is John Mulligan; age, forty-two; residence, Springfield, Mass.; and I am now master mechanic of Connecticut River Railroad. I commenced work for the Western Railroad in November, 1842, as machinist. About the year 1843 or 1844—I can't tell which of these years—the Western Railroad run crate baggage cars; they were platform cars with small cars on them, which could be run off and run on to the boat in crossing the river at Albany; that is what they were designed for. In consequence of a brake-chain breaking, one of these cars run off the dock at Albany. M'r Ephraim Harris was then foreman in the Western Railroad blacksmith shop at Springfield. He then went to work and got up a brake like the one shown in the model now present, and "Model A, E. Merwin, U. S. C." In the old crate-car brake, the chain broke, and, in consequence, the car run off the dock. M'r Harris went to work and got up this brake, so that it would brake on both trucks from either end of the car. That brake was in use so long as the cars were in use as crate cars. There were two of them that I know of. This new car brake was applied by M'r Harris, as above stated, in the year 1843 or 1844. They went to work right along and altered the tenders to the locomotives on the Western Railroad, and applied 1960 to them the same kind of brake as the one put on the crate-cars by M'r Harris. On the tenders, they used but one chain, and connected the rod from the lever in the hind truck to the lever in the forward truck. There was but one chain from the windlass to the upper end of the truck-lever nearest the windlass; and from the upper end of this lever a rod ran to the upper end of the lever in the truck at the other end of the tender. And the same brake is in use, at the present time, on the tenders of the Western Railroad, and has been in use since then to the present time.

Cross-examination by M'r Thomas Sayles, the complainant:

I understood, at the time this brake was got up by M'r Harris, that it was for the purpose, that in case one chain broke, they would have another brake to hold on by.

I never heard any complaint of this brake not working equally on both trucks. There might have been; I never heard of any. I understood that it answered the purpose for which it was designed at the time.

I do not know about the proportions of the model produced; but I should say that the principle is the same all through.

I do not know how long the brake was used on those crate cars; whether one, two, or five years.

The brake on the tenders operated only from one end; they could have been operated from the other end by the same apparatus duplicated; that is, by adding other levers, as seen in the model. I never operated the brakes as a brakeman.

Direct examination resumed:

I mean, by adding other levers and connecting them with a windlass at the opposite end of the tender, the same as at the forward end, it would then be like the model present, and could be operated from either end of the tender, and would apply the brakes simultaneously on both trucks, when properly adjusted. The brake would be properly adjusted by "turn-buckles," as seen in the model, between the trucks, under the car body.

JOHN MULLIGAN.

1961 *Deposition of Henry H. Snow.*

My name is Henry H. Snow; age, forty-three; residence, Springfield, Mass.; and I am a locomotive engineer on the Connecticut River Railroad. I went into the employ of the Western Railroad in 1843, I think. I had charge of the brakes and running-gear of the cars of this road, generally—to look them over, and see that they were in order for running. I knew M'r Ephraim Harris when I went into the employ of the Western Railroad. M'r Harris was foreman of their blacksmith shop. I went there in the spring, and they built two crate cars, and platforms for carrying them on. One was built that summer, and the other afterwards; whether the next winter or the summer after, I can't say. When the cars were built and sent out, they had what we called double brakes. You could stand at either end of the car, and bring the brakes on to both trucks at the same time. I have looked at model now produced, marked, "Model A, E. Merwin, U. S. C.," and think it is a correct representation of the brakes applied by M'r Harris.

I had charge of the cars with these brakes on, for one summer certain; and, I think, two. They were still on the cars when I left the charge of them, and went to work in the carpenter shop of the Western road. I did not work these brakes on the road; I only worked them when I repaired them. We used to have to take up these connecting-rods with a swivel, or turn-buckle, once in a while, so as to equalize the lengths of the chains and rods running from the windlasses to the two trucks.

I don't know that I saw the brakes used more than what I used them myself.

Int. Whether or not you heard any complaint as to the working of the brake?

(Objected to by the complainant.)

A. I never did that I know of.

1962 Cross-examination by M'r Sayles:

I can't swear that the model entire is correct in all its proportions, but the principle of the thing is there.

Direct examination resumed:

By the principle of the thing I mean the brakes as they are connected and operated in model A.

Cross-examination resumed:

I mean in the last answer the general arrangement of the brake, without reference to the proportions of the brake.

HENRY H. SNOW.

Deposition of Wilson Eddy.

My name is Wilson Eddy; age, forty-nine; residence, Springfield, Mass.; and I am master mechanic of the Western Railroad, and have been connected with that road as foreman of the shop and master mechanic for the last twenty-two years. In December, 1840, we had a severe accident here in Springfield, owing to the deficiency of brakes, by an engine and train coming down this grade. The engine and train were badly smashed up, and four men lost their lives. When this engine and tender were repaired, and before it was put upon the road again, there were brakes put upon both trucks of the tender. They are operated both from one windlass by a connecting-rod running from the top of the lever in the first truck to the top of the lever in the rear truck. The lever in the first truck was operated by a windlass the same as the single brake, and the same as if the rear truck had not been connected with it. This tender went out of the shop in the spring of 1841, in April, I think. M'r Ephraim Harris got up this brake and applied it to the tender. This brake has been used from that time constantly on the tenders of this road, and is the one now in general use on our tenders. The
1963 brake shown in the model now before the commissioner, marked "Model A, E. Merwin, U. S. C.," was got up and applied to two crate cars by M'r Harris in 1842 or 1843, according to my best recollection. It was in use on those cars as long as the cars were in use, which was some two or three years; I can't recollect the time exactly. When the cars went out of use, the necessity of the double brake went out with them. I understand that this brake applies the power of the brakeman simultaneously to the brakes of both trucks, and at either end of the car.

Cross-examination by M'r Thomas Sayles, the complainant:

I should think that the brake shown in Model A did not apply the brakes equally when on a curve and on a straight line; but it will do so as nearly as a single brake.

I mean to say that this model is the same in all its essential parts as the one applied to the crate cars. I would not say positively that these levers were not in a little different position; and I am inclined to think that the truck levers were between the windlasses and the outer or front ends of the truck-frame. I should not think the crate cars were used when the river at Albany was frozen over. I can't say that I ever worked these brakes myself.

Direct examination resumed:

I know that the Springfield brake as shown in Model A was essentially the same as the one put on the express-line cars running from Boston to New York. I recollect that there was but one chain around the windlass, and that the lever of the truck at the other end of the car was connected the same as I have described in the tenders. The car was broke by the same apparatus from either end of the car.

Cross-examination:

This brake was sometime after taken off the express-line cars, and the Hodge brake was put back. I can't tell how long this brake was on. I do not know why this change was made.

* * * * * * *

WILSON EDDY.

1964 *Deposition of Wilson Eddy.*

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Wilson Eddy; my age is fifty-nine years; residence, Springfield; occupation, master mechanic on the Boston and Albany Railroad.

Int. 2. How long have you been connected with the Western Railroad, and the Boston and Albany Railroad?

A. Thirty-two years, come October.

Int. 3. What positions have you occupied during that time?

A. For the first ten years, as foreman in the locomotive department; since that time, as master mechanic.

Int. 4. Were you a witness in the case of Henry Tanner against the New York and Erie Railroad, which case was tried at Albany a number of years ago? If so, state when.

A. I was a witness; I think somewhere about 1854, to the best of my recollection.

Int. 5. Did you produce a model at that time illustrative of the application of the old Springfield brake to a car?

A. I did.

Q. Have you been examined in this case before; if so, about when?

A. I should think, according to the best of my recollection, about 1862.

Int. 7. When called upon for information in reference to the use of the old Springfield brake on the Western road, did you furnish to the person calling upon you for such information a model the same as you exhibited to the court at Albany?

A. I think I furnished the same identical model to M'r Whipple.

Int. 8. Did you give evidence on the model as then produced, marked "Model A, E. Merwin, U. S. C.," in this case in 1862?

A. I think it was the same.

1965 Int. 9. You did give evidence on that?

A. I did give evidence.

Int. 10. I will here state that the model there produced was burned in the conflagration at Chicago last October, and hence the defendants have been obliged to produce a model like the one burned. Will you please now look at the model marked "Model A. E. Merwin, U. S. C." and state whether the model as to the representation of the brake is the same as the model which was burned?

A. The model, so far as the representation of the brake is concerned, I should think is the same. I can't see that there is any difference.

Int. 11. In your deposition taken in this case in September, 1862, you say, "In December, 1840, we had a severe accident here in Springfield, owing to the deficiency of brakes, by an engine and train coming down this grade. The engine and train were badly smashed, and four men lost their lives. When this engine and tender was repaired, and before it was put upon the road again, there were brakes put upon both trucks of the tender." Will you please look at "Defendants' Exhibit, old Springfield tender brake," and state whether that is a representation of the brake as applied to the tender of the engine referred to in the above quotation?

A. I should think it was. I don't see any reason why it is not. I cannot state positively as to the relative position of those levers—whether one of them was placed between the windlass and the truck or not.

Int. 12. Will you please state whether, in that or any other tender thereafter to which the brake was applied, the levers were applied outside the bar or inside the bar; and whatever answer you may give, please give your reason.

A. I should think like enough, from the construction of that tender, that the lever might have been between the windlass and the truck, from the fact that there was a long platform. The tender that the brake was put on was the first eight-wheel tender ever built in New England, and it was thought necessary to have a large space be-
1966 tween what we call the tank and the end of the tender, or a plat-
form extending some three or four feet, according to the best of my recollection, beyond the tank, between the tank and the foot-board of the engine, for the purpose of carrying wood and oil, boxes, and such like. That platform, extending beyond here [referring to model] and over the truck, would leave ample room for the lever to be between the end of the truck and the windlass. I should think it gave three or four feet as the length of this platform.

Int. 13. You will now state what modifications were made in those tenders thereafter, and state how you were obliged to apply the brakes in consequence of that alteration?

A. We found, when they came into use, that that room was unnecessary, and as soon as the tenders became rotten (one or two of them, according to the best of my recollection, were smashed up), we shortened the frame of the tender, and after that the levers were put over on the other side, put back of the forward end of the truck-bar. I do not say positively that the lever in the long tenders, even, was between the end of the truck and the windlass; it may have been.

Int. 14. How are the levers of the old Springfield brake now applied upon the tenders of your road?

A. They are attached to the back beam of the truck, farthest from the windlass.

Int. 15. Is the application the same as seen in "Defendants' Exhibit, old single brake?"

A. It is.

Int. 16. At how early a time did you make this change, as seen in the old single brake referred to?

A. I cannot tell.

Int. 17. According to your best recollection, at how early a time did you make the change; or, in other words, how soon after the change in the platforms of the tenders you have already spoken of?

A. If you put me on my memory, I shall have to say I don't know anything about it.

1967 Int. 18. When was the change from the lever, as seen in "Defendants' Exhibit, old Springfield tender brake," made to the way in which it is seen in "Defendants' Exhibit, old single brake?"

A. I don't undertake to tell exactly the position of these levers at any definite time. I know the fact that, from the spring of 1841 up to the present time, the brakes on all the tenders, so far as my knowledge goes, have been brakes that would brake on both trucks, the ends of the long levers connected together by a rod, and winding around one windlass, and braking on the two trucks; but when the change was made from the old tender brake exhibit to the old single brake exhibit, I cannot say.

Int. 19. Does it in any way change the character of the old Springfield brake, whether it is used as seen in "Defendants' Exhibit, old Springfield tender brake," or as used at one end of "Defendants' Exhibit, large Springfield brake, 124?"

A. So far as equalizing the power on the two trucks is concerned, it does not. The difference, as I understand it, is simply that we wind one chain round the windlass with the tender brake as applied to the tender, and two with the car-brake.

Int. 20. Does it make any change in the operation, or in the result of the operation?

A. I cannot see that it does, in any essential particular.

Int. 21. What would be necessary to make a car-brake like "Defendants' Exhibit, large Springfield brake, 124," out of the tender brake?"

A. It would require another set of levers, another windlass, and three more chains or connections.

Int. 22. Could you resolve the other end into one chain, by connecting the two levers together, and have it the same?

A. I don't see why I could not. Certainly I could.

Int. 23. Please state whether the old Springfield brake has been in use upon the tenders of the Boston and Albany Railroad, in one form and another, from the year 1841 to the present time.

A. It has, universally.

1968 Int. 24. Will you please state to what extent the old Springfield brake was applied to the cars of the Western Railroad, and when it was applied?

A. It was put on to two cars, commonly called crate-cars. The exact time I can't say.

Int. 25. About what year, to your best recollection?

A. I don't think my memory in that respect is definite enough to fix any time, or any time within a year or two.

Int. 26. What time do you think, within a year or two, it was applied?

A. I think it was between 1842 and 1844, according to the best of my recollection.

Int. 27. How long was it continued in use on said crate-cars?

A. Until they were thrown aside.

Int. 28. How long a time was that?

A. Well, my memory is not very definite on that point.

Int. 29. While they were in use on the said crate-cars, were they applied and used substantially as seen in "Defendants' Exhibit, large Springfield brake, 124?"

A. I think they were. I don't know that there was any essential difference.

Int. 30. Did they answer the purpose for which they were put upon said cars?

A. I never heard anything said to the contrary.

Cross-examined by M'r Cozzens:

Cr.-int. 1. On those crate-cars, was not the long chain uppermost?

A. I don't recollect.

Cr.-int. 2. So far as you know, it may have been, may it not?

A. I don't know anything about it, neither one way nor another.

Cr.-int. 3. It is not uppermost, is it, on the large model of the Springfield brake?

A. No, sir; it does not seem to be in the model exhibited.

Cr.-int. 4. Please state, if you can, what, upon the scale of "Model A, E. Merwin, U. S. C.", would be the length of the short chains and rods on the crate-cars, as they were run.

1969 A. I don't think I can. I have got this model; but I have not got the cars.

Cr.-int. 5. Then you think, do you, that it cannot be told, from "Model A, E. Merwin, U. S. C.", what the length of those two short chains and rods and long chains and rods in the crate-cars was?

A. I don't know how to do it.

Cr.-int. 6. Who made this present "Model A?"

A. I don't know, sir.

Cr.-int. 7. Was it made under your direction?

A. No, sir.

Cr.-int. 8. When did you first see it?

A. I don't recollect that I have ever seen it until to day.

Cr.-int. 9. Then it is mere memory with you, is it, as to whether it is a correct copy of the model which was burned?

A. How else should I know it?

Cr.-int. 10. I don't say that you should. I only want to know whether that is the way you get at it.

A. I don't know it any other way, only from memory. I have no data or dimensions to go by. That model differs, in some slight respects, from the other model, according to the best of my memory; but so far as it illustrates the brake, I cannot see any difference.

Cr.-int. 11. When the lever on the forward truck in the Springfield tender brake was placed upon the inside of the brake-bar, what would be the distance from the centre of the top of that lever to the centre of the windlass?

A. I don't know.

Cr.-int. 12. Can you tell anything about it?

A. I say to you that I don't know.

Cr.-int. 13. How far back from the front end of the tender was the windlass placed in those old tenders you have spoken of?

A. According to the best of my recollection, it was placed very near the front end, right at the corner.

Cr.-int. 14. In the ordinary running of trains is the brake on the tender used much?

1970 A. In the ordinary running of passenger-trains I think it is not used much. In the running of freight-trains it is used occasionally, when they want to stop sooner than they think the brakemen will stop them. In switching freight-trains it is used very generally.

Cr.-int. 15. You have said that, so far as equalizing the power on the brakes was concerned, you saw no difference between the arrangement of the old Springfield tender-brake and the arrangement of the Springfield brake at one end in "Defendants' Exhibit, large Springfield brake, 124." Suppose, in a brake arranged like said "Defendants' Exhibit, large Springfield brake, 124," one of the two chains should catch on the windlass shaft, so as to wind spirally around the staff, while the other chain wound straight around the shaft, do you think that then the brake would pull equally on both trucks?

A. Am I put here as an expert, or to tell what I know?

Cr.-int. 16. It is not for me to say. I want you to answer it to the best of your ability. You may answer it as an expert, or from what you know; I don't care. I only want you to answer it.

A. If I am allowed to say what I think, I think it is begging the question. The staff-rod comes through somewhere. It is a rod, not a chain——

Cr.-int. 17. Look at it there (in "Defendants' Exhibit, large Springfield brake, 124"); that is all I am asking you about.

A. Well, there is a rod comes up to a certain length, and that rod is supported there; and I do not see that a long rod and chain attached to it would be any more likely to wind spirally on a windlass than the short rod and chain.

Cr.-int. 18. Question repeated.

A. If one chain does wind spirally around the windlass and the other chain does not, why, it will pull unequally.

Cr.-int. 19. Previous to the putting upon the two crate cars, of which you have spoken, of what has been called the old Springfield brake, what kind of brakes were used on the cars of the Western Railroad, now the Boston and Albany Railroad?

A. I know of none being in use except what is termed the single brake.

1971 Cr.-int. 20. You are aware, I suppose, that the form of double-acting brake at present in use, on what is now the Boston and Albany Railroad, is the Hodge brake?

A. Yes, sir.

Cr.-int. 21. Have you any knowledge of any attempts made at any time on the Western Railroad to get up double-acting brakes, between the time when the Springfield brake was put on these two crate-cars and the time when the Hodge brake was introduced on said railroad?

A. I don't know that I have, on this road in particular.

Cr.-int. 22. What do you mean by "this road in particular"—the Western road, part of it, or what?

A. No, sir. I mean that a man by the name of Nichols, to the best of my recollection, worked on a brake for considerable time, and got up a brake and put it on the Hartford and New Haven road. At least, I so understand it; I think so.

Cr.-int. 23. Was Nichols in the employ of the Western Railroad before going on the Hartford and New Haven Railroad?

A. He was.

Cr.-int. 24. Do you know about how long?

A. Well, several years; I can't tell.

Cr.-int. 25. Can you give any idea, without being very accurate about it, about from what year to what year?

A. No, sir; I don't know as I should want to state.

Cr.-int. 26. Can you say previous to what year?

A. No, sir; I don't know when he came, nor exactly when he went away, according to the best of my recollection.

Cr.-int. 27. Do you know of a brake which had in it a chain which ran from one end of the car to the other, around pulleys, and was put on passenger-cars of the Western road?

A. I do, sir.

Cr.-int. 28. Was that a brake which was designed to operate on all the wheels of the car from either end of the car?

A. Yes, sir.

Cr.-int. 29. About what time, as nearly as you recollect, was that brake tried on the Western Railroad?

1972 A. Well, I got the brake up myself, and put it on. It was, say, twelve or fifteen years ago. I don't want to fix it very definitely.

Cr.-int. 30. Was it before the Hodge brake was introduced on the Western road?

A. No, sir; I think it was before they bought the Hodge brake. It was not used much of any, if it was any, before this brake was got up. My intention was, of course, to obviate the necessity of buying the Hodge brake.

Cr.-int. 31. Did you apply for a patent for this chain-brake?

A. I did.

Cr.-int. 32. About how soon after you got it up did you apply?

A. I should say a few months.

Cr.-int. 33. Will you please bring in the patent this afternoon, that we may see the way the Patent Office has entitled the invention, so that we can know how to send for this date?

A. I will.

Cr.-int. 34. Did you not get up another brake, intended to act on both ends of the car from either end of the car?

A. M'r Emery Stebbins and myself did.

Cr.-int. 35. When did you get that up?

A. I can't fix the time; but it was previous to the chain-brake, according to the best of my recollection.

Cr.-int. 36. Did you apply for a patent for that?

A. We either applied for a patent or filed a caveat. I think we only filed a caveat.

Cr.-int. 37. What was the distinguishing feature of this last-mentioned double-acting brake?

A. There were two pulleys fixed in a frame, and that frame was allowed to slide in the centre of the car, fore and aft, and a chain went around each of these pulleys, so that when you pulled on one you pulled on the other, and consequently pulled on the brake operating on the opposite truck.

Cr.-int. 38. Was this sliding-frame brake designed to operate as an equivalent for the Hodge equalizing levers?

A. It was.

1973 Cr.-int. 39. Was said sliding-frame brake put upon one or more cars on the Western Railroad? If so, how many cars?

A. On one or two.

Cr.-int. 40. About how long was it continued in use on these cars?

A. I have no recollection.

Cr.-int. 41. Was it some little time?

A. Some little time, I should think; might be a year; might be more, might be less; might be, I should say, a year or two.

Cr.-int. 42. Down to about what year were single-acting brakes, operating upon only one truck, continued in use upon the passenger-cars of the Western Railroad?

A. I know they were continued here longer than upon almost any other road. I don't recollect the time when we bought the Hodge brake; but immediately on purchasing the right to use that brake we shifted from the single to the Hodge brake. I should think it was after I was called upon to testify in this same case in 1862. I should think it was as late as 1863 or '64.

Cr.-int. 43. After using the Springfield brake, as you have stated, on the two crate-cars, was it used on any other cars of the Western Railroad?

A. I can't tell you.

Redirect:

Int. 31. Please state what your primary object was in getting up the double-pulley brake, such as you applied for a patent for?

A. The object was to get a brake that would brake equally on all the eight wheels of a car, and have as good a brake as was in use, and obviate the necessity of the company's purchasing the right to use from other parties.

Int. 32. The question may arise why you attempted to get up another brake, such as the pulley-brake to which you have referred? If so, knowing as you did of the existence of the old Springfield brake, why not apply the old Springfield brake to a car, instead of attempting to get up one?

A. The old Springfield brake does not brake alike on all the wheels. My object was to get up one that did.

1974 Int. 33. And to obviate the purchase of patents?

A. Why, yes; but we were not obliged to buy the old Springfield brake. The object was to get up a brake that would brake on all the wheels alike, and have a good brake, as good as there was in use.

Recross:

Cr.-int. 44. Do you mean the Hodge patent, for one?

A. Yes, sir.

Cr.-int. 45. Does the Hodge brake brake alike on all the wheels?

A. No, sir.

Redirect:

Int. 34. You have stated that you got up a double brake called the pulley brake, about the year 1857 or 1858, and that a patent was obtained for the same. Was said brake, in your judgment, a practical operative brake?

A. It was.

Int. 35. If so, please state why the company did not adopt the same, in preference to some other double brake.

A. The company had purchased no right to use the Hodge, Stevens, or Tanner brake, and we were satisfied that we should be called upon for infringing perhaps the Hodge and Stevens brake.

Int. 36. To what extent was this pulley-brake used?

A. It was used on two cars, I think, for one or two years.

Int. 37. When the company finally decided to adopt the double brake on their main line, between Albany and Worcester, what patent did they finally decide to purchase and adopt?

A. I think the Hodge.

Int. 38. At what time did Ephraim Harris, who formerly had charge of the blacksmith shop of the Western Railroad, leave the service of said railroad?

A. I can't fix the date very definitely; but I think somewhere from 1851 to 1853.

Int. 39. Under what circumstances did said Harris leave the employ of the company now the Boston and Albany Railroad Company?

A. He was discharged.

1975 Int. 40. Why discharged?

A. For taking money from workmen, for giving them a situation in the shop, and for exacting from them money to retain their situation after he had given it to them.

Recross:

Cr.-int. 46. Did Hodge sue the Western Railroad corporation for infringing his patent, on the line cars from Boston to New York?

A. I have no positive knowledge of it; but I so understood it.

Cr.-int. 47. Were there several suits brought by Hodge for said infringement?

A. I am not positive, but think there might have been. After some difficulty about this matter, I understood they purchased the right to use the Hodge brake.

Cr.-int. 48. At folio 537, of defendants' accounting proofs, you stated that you would bring in the patent there referred to. Is said patent now present? and, if so, will you state who was the patentee named in it; what is the date of it, and what is the title of the invention given in it?

A. The patent is present. The patentee named in it is J. N. Ward, of Brooklyn, New York; the date of it is Nov. 2d, 1858, and the title of the invention given in it is "Improvement in car-brakes." The number of patent is 21996.

Cr.-int. 49. Your application was put into interference with the case of J. N. Ward, was it not?

A. It was. As the invention was the same in both cases, we abandoned our application and made arrangements with M'r Ward, whereby we obtained half of his right, and caused the patent to be issued; and that patent is the one now produced.

Cr.-int. 50. Will you please state, as near as you can, what was the length of the crate cars on which the Springfield brake was applied, on the Western Railroad, in 1843 and 1844?

A. To the best of my recollection, about 45 feet. I know they were very long cars, for the times.

Cr.-int. 51. What is the length of tenders on the Boston and Albany Railroad?

1976 A. On our first-class engines our tenders are 18 feet and 3 inches. I think these are as long as any; we have some shorter.

Cr.-int. 52. About how much do the tender bodies project beyond the trucks?

A. Say about 6 inches at the rear end, and about 12 inches at the front end.

Cr.-int. 53. Were both of the double brakes that you have referred to on pages 137 and 138 of defendants' accounting proofs hand-brakes operated from windlasses at the ends of the cars in the usual manner?

A. Yes.

Cr.-int. 54. You have spoken, in your direct examination, of Ephraim Harris being discharged from the employ of the Western Railroad. Did you discharge him yourself?

A. No, sir.

Cr.-int. 55. Do you know why he left the road, except from report?

A. I know of it from conversation with the superintendent, my own observation, and conversations with the men. I was satisfied that he was spending more money in his manner of living and incidental expenses than he was receiving as salary from the road. This last is what I refer to as my own observation.

Cr.-int. 56. You mean, I suppose, this was your judgment? You couldn't know it positively.

A. Yes; it was my judgment. I didn't know it positively.

Redirect:

Int. 41. Do you know it positively that he was discharged?

A. I know that the superintendent told me so, and that he left very suddenly. And I never heard any fault found with his work, and think it could not be on that account.

(Complainant objects to the thoughts and hearsay stated by the witness.)

I wish to further say that I found no fault with his work myself; and I should, if anybody.

1977 Int. 42. Is there any doubt in your mind that he was discharged for the reasons stated in your previous examination?

(Objected to as incompetent by the complainant.)

A. Not the slightest doubt.

Int. 43. You speak of conversations with his men; what in substance were said conversations?

(Objected to.)

A. The language I don't recollect; but the substance of their conversations was, that they had paid him money for their situations, and, to retain them, a monthly stipend.

Int. 44. Do you believe such conversations to be true?

(Objected to.)

A. I do.

WILSON EDDY.

Deposition of Emery Stebbins.

My name is Emery Stebbins; age, thirty-six; residence, Springfield, Massachusetts; and I am car-inspector on the Western Railroad, at Springfield. I have been in the employ of the road twelve years—part of the time in the wood-shop, on repairs.

I know of the use of a brake, on the cars of the Western Railroad, similar to that represented in the model now before the commissioner, marked "Model A, E. Merwin, U. S. C." We first used it on car No. 2 of the Western Railroad. It was a passenger-car. I should think it was about six years ago—about the year 1855 or 1856—that we put it on this passenger-car; and was used about two years, I think, on that car at that time. It was put on to what line cars we had soon after that —on all the cars in the express line between New York and Boston. It was put on to twenty-two or twenty-four cars, passenger and baggage, at that time. They were on about sixteen months; it was over a year, I know. 1978

All the difference between the brake exhibited in the model and the brake which was applied to those twenty-two or twenty-four cars was, that in the brakes of these cars but one chain wound round the windlass, and that chain was attached to the upper end of the lever in the first truck, and a rod attached to the same point connected it to the upper end of the lever in the second truck; and the same may be said of the attachment at the other end of the car. The reason why we put it on in this way was to get rid of the second chain, and save us the trouble of altering the windlasses; but it didn't make the brake any better.

This brake applied the brakes simultaneously to both trucks, and from either end of the car. I operated these brakes while switching the cars. I call it a good brake when in order. It was no more liable to get out of order than other brakes.

I am acquainted with the centre-lever or Tanner brake. I think you can apply the power to the trucks as well with the brake shown in Model A, as with the Tanner brake, and at either end of the car.

Cross-examination by M'r Sayles, the complainant:

I never operated the Tanner brake or the Springfield brake out on the road; no other way than switching in the yard. I know why these Springfield brakes were put on the express-line cars. When the express cars were built, the Hodge brakes were put on the cars and on to the road, and the Western Railroad did not own the right to use them; and that is the reason why the Hodge brake was ordered off, and these Springfield brakes were ordered on, and they were put on. I don't know whether Hodge commenced a suit or not. I don't know why this brake was not continued on the cars, but think some compromise was made, by which the right to run the Hodge brake over this road was obtained. The Hodge brake was put back, after the Springfield brake had been running sixteen months. The Springfield brake was 1979 abandoned, after running some sixteen months, and the Hodge brake was put back again on these twenty-two or twenty-four cars.

The levers in the express-line cars were arranged the same as in the model, except that in the express cars the short arm of the first truck-lever set on the connecting-rods of the brake operating from the other end of the car. The operation was just the same and the result was just the same.

The bottom end of the truck-lever set in a slot on the connecting rod, with a pin through it, so as to hold it permanently in its place, instead of being attached to the brake-bar. The result would be just the same in either case.

The brake we had on the car of the Western road was precisely like the one in the model. That has been removed, and the single brake put in its place. The Springfield brake was on this car two or three years. I should think it was put on the last of 1855 or the first of 1856, about that time.

Direct examination resumed:

The brake in general use now on the Western Railroad is the single brake; and always has been since the opening of the road, so far as I know.

EMERY STEBBINS.

Deposition of John Lightner.

Int. 1. What is your name, age, residence, and occupation?

A. My name is John Lightner; nearly sixty years old; reside in Roxbury, Mass.; occupation, car-builder for the Boston and Providence Railroad.

Int 2. How long have you been car-builder for the Boston and Providence Railroad?

A. I have been in their employ ever since 1834.

Int. 3. How long have you had charge of the car department of that road?

A. About 34 years.

Int. 4. What brake is in general use on the passenger-cars of the Boston and Providence road?

1980 A. At the present time, the Hodge brake.

Int. 5. What brake did you use on the passenger-cars on that road before the company adopted the Hodge brake?

A. Pretty much the Tanner brake.

Int. 6. Please look at "Exhibit, large Tanner brake, 123," and state whether you put on the Tanner brake with a centre-lever connected as this lever is connected.

A. That was generally the principle we put it on. On two or three cars I hooked the rod in, just the same as I did for Mr Sayles; but only from three to six inches, more or less.

Int. 7. Are you acquainted with what is called the old Springfield brake?

A. So far as it was put on our road.

Int. 8. When did this old Springfield brake first come to your knowledge?

A. When I was directed by you (Mr Whipple), through Mr Folsom, superintendent of the Boston and Providence Railroad, to put it on. That is the first knowledge I had of it.

Int. 9. About what time was that?

A. I can't seem to recollect exactly the time.

Int. 10. Some time last winter?

A. I think it was.

Int. 11. Did you see it first on a model or on a car?

A. I saw it first on a model.

Int. 12. Is the model here? If so, please point it out.

A. Well, that ("Exhibit A, E. Merwin, U. S. C.") seems to be the nearest like it; only the levers are differently constructed, you know. I mean the difference of construction was not in the model, but in the car to which I applied it.

Int. 13. Did you apply this brake to one or more cars on the Boston and Providence Railroad?

A. I applied it to two.

Int. 14. And in the same way as seen in the model, or in a different way? And if in a different way, explain how you applied it.

A. Well, instead of putting the short arms of the levers on the brake-bars, as seen in the model, I put the fulcrums of the levers on
1981 the bars, in the manner seen in "Defendants' Exhibit, old single brake;" and connected the same with the windlasses of the car, at either end, by two chains. By this I mean to be understood, that the connection between the windlass and the first lever ran to the inner side of the truck, and was some 14 feet long, while the long rod ran from the same windlass to the further truck, and the same mechanism was duplicated from the other end.

Int. 15. About the same time that you put the old Springfield brake on to two cars, did you apply the Tanner brake to another car?

A. Yes, sir.

Int. 16. Please name the cars on which you applied the old Springfield brake.

A. I believe they were Nos. 12 and 40, and the Tanner brake was applied to car No. 10.

Int. 17. What is the weight of the cars to which both brakes were applied?

A. Well, if I should guess (it would be a matter of guess-work), I should think they were about equal; and I should think each car would weigh about 18 tons.

Int. 18. Were the cars of the same pattern or build?

A. Yes, sir; they were of the same pattern.

Int. 19. And by whom built?

A. By Bradley.

Int. 20. Can you give us the length of the long arm of the levers, and also the short arm of the levers, in the trucks of the old Springfield brake?

A. Yes, sir; the short arm, six inches long; the long arm, two feet five inches; the fork that supports the lever, eight inches from the inside of the beam to the centre of the lever.

Int. 21. Please state, if you have it, the fulcrum in the levers applied on the Tanner brake.

A. The short arm was six inches, and the long arm was two feet four inches, and the fork eight inches.

Int. 22. What was the length of the centre-lever?

A. Four feet.

Int. 23. How were the rods running from the truck-levers to the centre-lever connected with said centre-lever, at the end or a few inches from the end?

1982 A. The first I put on the rods were connected with the outside end, the same as "Defendants' Exhibit, large Tanner brake, 123;" then they were shifted ten inches from the end of the lever, towards the centre of the same.

Int. 24. At whose request was this modification made?

A. M'r Sayles.

Int. 25. In putting on the modified Tanner brake, did M'r Sayles have everything just as he wanted it?

A. Yes, sir; to the best of my knowledge.

Int. 26. In every respect?

A. In every respect, to the best of my knowledge.

Int. 27. Was the leverage in the truck changed from what it was when you put it on in your way?

A. There was some alteration made, so as to make it conform with the Springfield brake; everything accurate, you know, as near as we could.

Int. 28. State whether the Tanner brake is in use on passenger cars on any road with which you are acquainted.

A. I know of no road with which I am acquainted that I could say.

Int. 29. What brake is in general use in New England on passenger cars?

A. The Hodge brake, in my opinion, as far as I know.

Int. 30. Who is conductor on the train on which the Springfield brakes are used?

A. M'r Lincoln.

Int. 31. And who is the brakeman?

A. M'r Rogers.

Cross-examined by M'r Sayles:

Cr.-int. 1. Were the lengths of the truck-levers and their arms alike in both cars having the Springfield brake on your road?

A. Well, I measured the levers on one of the cars with the Springfield brake, and I measured the levers of the Tanner brake, and I found there was a variation of one inch in the long arm of the levers.

Cr.-int. 2. You did measure the levers in the other car having the Springfield brake?

1983 A. No; I only measured the levers in the Tanner brake and in one of the Springfield brakes. They won't vary over an inch; I will guarantee that.

Cr.-int. 3. Why did you put the Springfield brake on differently from the model that was shown you? Was it by M'r Whipple's orders? Did you put them on the cars just as M'r Whipple directed?

A. It was put on as M'r Whipple ordered, all through.

Cr.-int. 4. Which, in your judgment, would work the best, where the short chain from the windlass to the first lever was three feet and four inches, or three feet and a half long, as shown in the "Model A, E. Merwin, U. S. C.," or where the lever is placed at the other end of the truck, as in your car, and that rod fourteen feet long?

A. In my judgment, that rod fourteen feet long would work the best.

Cr.-int. 5. In your judgment, would it be safe to run a train of passenger cars at a high rate of speed, supposing the first lever is placed outside the end of the truck, and the chain attached from the windlass to that lever, which brought the lever within fourteen inches of the windlass? Would it be safe to run a train of cars, in your judgment, with a brake arranged like that?

A. I should prefer not to have it so.

Cr.-int. 6. Would you consider it safe to run a train of passenger cars in that way; to apply the brake on a straight track, and run from straight tracks to curves, and vice versa, with a brake so arranged?

A. I am hardly prepared to answer that question. I did not expect that question was coming up, so I am hardly prepared to answer it.

Cr.-int. 7. Would you be willing to take the responsibility of arranging a train of passenger cars in that way and have it run over your road at a high rate of speed, and have the brakes applied on straight tracks, and run from straight tracks to curves, with the brakes so applied?

A. I am not prepared to answer that question.

Cr.-int. 8. Do you think that a brake arranged in that way, with a fourteen-inch chain, would swivel freely around a curve?

1984 A. Well, M'r Sayles, I have not looked into the matter. I never saw a car constructed in that way, and therefore I am not prepared to say what I should think about it.

(Plaintiff put in drawing marked "Complainant's Accounting Exhibit, No. 1, J. M. W. Y.")

Cr.-int. 9. Please look at "Complainant's Accounting Exhibit, No. 1, J. M. W. Y.," and state whether you would consider that a safe brake to put on a passenger train.

A. I have not seen any construction in that way, and I am not prepared to answer the question. I have not looked into that at all. My whole attention was paid to the way we constructed them.

Cr.-int. 10. Those short chains are represented on the drawing to be 14 inches long. If that lever at the end of the 14-inch chain was placed inside the truck, so as to make a chain three feet and four inches, or three feet and a half long, do you think it would work better than with a chain fourteen inches long?

A. Why, it would give it little more motion.

Cr.-int. 11. Give it a better chance to turn the curves, do you mean?

A. Well, it would give it a little more motion, I admit.

Cr.-int. 12. Do you think one three feet and four inches would work better than one fourteen inches long?

A. I think it would give it some more motion. I can't tell. I would prefer to see one before I give any definite opinion about it. I have never seen one; therefore I am a little particular about it. If that is hooked back fourteen feet from the windlass, as on our cars, I should not be a bit afraid of it.

Cr.-int. 13. You mean, when you say it would give it more motion, that it would give more freedom to trucks in swivelling on the curves?

A. Yes; I mean there isn't enough to make any defect worth speaking of on our road, the way we construct it, it is such a trifle. I don't know what it is on other roads. I admit there is a variation there,
1985 even in ours. When you set the brakes on a curve, and run on to a straight track, I admit there is a variation; but it never seemed to have any effect on the brakes I had on, to my knowledge.

Cr.-int. 14. Did you ever apply them on curves and straight tracks?

A. No, sir.

Cr.-int. 15. What brake do you consider the best brake now in use?

A. I consider the Hodge hand-brake the best in use.

Cr.-int. 16. Are you acquainted with the Stevens brake?

A. Somewhat acquainted with it.

Cr.-int. 17. Do you think the Hodge very much better than the Stevens?

A. I do, sir, for railroad purposes.

Cr.-int. 18. Are you acquainted with the wearing of the brake-shoes on cars?

A. Some acquainted with it.

Cr.-int. 19. Is it a common thing for one brake-shoe to wear out a great deal faster than another?

A. Yes, sir.

Cr.-int. 20. What difference is there in the wearing of shoes generally on cars?

A. It depends a good deal upon the metal. Sometimes we have softer metal than at others, and that makes a difference. If the metal was all alike, the wear would be where the most power is applied.

Cr.-int. 21. How is it on your road, as a general thing?

A. As a general thing, it is where the most power is applied; but we find sometimes the shoe wears a little faster, and then again we have had metal that was hard; it don't make any difference, you know.

Cr.-int. 22. Do some shoes often, or occasionally, wear two or three times as long as others of the same character?

A. Well, all I could say about that is this, that there are times when one shoe will last a great deal longer than another; but how much, I can't say. That is all owing to the hardness of the metal. We have had a pair of shoes on one truck, and one would wear a great deal faster than the other. One would wear out where the other
1986 would hardly wear any, on account of the difference in the temper of the metal.

Redirect:

Int. 32. Please look at "Defendants' Exhibit, Large Springfield brake 124." and then at "Complainant's Exhibit, No. 1, J. M. W. Y.," and state whether the connections with the windlass, as represented in both exhibits, are substantially different or substantially the same.

A. Well, according to my judgment, they appear to be substantially the same.

Recross:

Cr.-int. 23. Is the short chain or connection from the windlass to the first lever longer than represented on the drawing?

A. I should think that (in old Springfield brake) was longer than 14 inches.

(It is agreed that the "Complainant's Accounting Exhibit, No. 2, J. M. W. Y.," is a correct representation of the mode in which the Springfield brake was applied to the two cars, No. 12 and No. 40, on the Boston and Providence Railroad.)

JOHN LIGHTNER.

Deposition of G. F. Lincoln.

Int. 1. What is your name, age, residence, and occupation?

A. My name is George F. Lincoln; age, 34; occupation, conductor on the Boston and Providence Railroad.

Int. 2. How long have you been so occupied?

A. Six years.

Int. 3. On what train are you conductor on the Boston and Providence Railroad?

A. On the 10.30 a. m. train from Boston.

Int. 4. How many cars compose the train?

A. Four passenger and one baggage car.

Int. 5. What brakes are in general use on the Boston and Providence Railroad?

1987 A. The Hodge brake.

Int. 6. What brakes are in use on this train which you run?

A. On two cars we have the Springfield brake; on one car the Tanner brake; and on the other two the Hodge brake—all in the same train.

Int. 7. How long has the old Springfield brake been in use, and how long the Tanner brake, on your train?

A. Some time last December the Springfield brake was put on; the Tanner brake, I think, a few days after.

Int. 8. On how many cars is the old Springfield brake?

A. Two cars.

Int. 9. What are the numbers of the cars?

A. No. 12 and No. 40.

Int. 10. On how many cars is the Tanner brake?

A. One—No. 10.

Int. 11. Has there been any modification of the Tanner brake since it was first applied?

A. There has.

Int. 12. By whose request was the modification made?

A. M'r Sayles', I believe.

Int. 13. How has the Tanner brake worked since the modification by M'r Sayles?

A. Very well.

Int. 14. Better than when put on by M'r Lightner the first time?

A. I think it has.

Int. 15. I wish to institute a comparison between the working of the old Springfield brake and the Tanner brake, as modified by M'r Sayles. Will you please do so, and state the result of such comparison?

A. You can brake a train up quicker, I think—I know so—with the Springfield brake, than you can with the Tanner brake. It takes the slack quicker; there is not so much slack.

Int. 16. At the Mansfield station on your line, on what car and brake do you allow the brakeman to bring the train to rest, after the engine is cut loose from the train?

A. On No. 10, No. 12, and No. 40; we change them alternately.

1988 Int. 17. That is, you use either the Tanner or the Springfield brake?

A. Yes, sir.

Int. 18. Is the control of the train left entirely to one or the other of these brakes at this station?

A. We have a brakeman at the rear end of the train, should anything happen; but, as a general thing, one man holds it.

Int. 19. What is the object of cutting off the engine at that place?

A. At Mansfield, we take on the Taunton and New Bedford train. We run down, and back on to the New Bedford track, and take that train on; and then go down on to the Boston and Providence track, and back down and take on our train. We take water there, and the object is to save time.

Int. 20. Then both brakes are deemed by you to be reliable in this particular place?

A. Well, we have depended on them.

Int. 21. Have you any preference as to which brake is used at the head of the train, after the engine is cut loose, on the score of certainty of control and quickness of action?

A. Yes, sir; I should prefer the Springfield brake which we have been using.

Int. 22. For what reason?

A. Well, as I said before, it takes hold quicker, and I think I can hold the train better with it.

Int. 23. In view of your responsibility as conductor of the train, do you or not deem the old Springfield brake, properly taken care of, a safe brake?

A. I do, so far as I have knowledge.

Int. 24. Have you operated this brake yourself, both on curves and a straight track, and while the car was running under the brakes from a straight track to a curve, and vice versa?

A. I have.

Int. 25. With what result?

A. I have not found any difference yet between the Springfield brake and the others, in running from a straight track to a curve.

1989 Int. 26. Have you discovered any difficulty in applying the Tanner brake, in running from a straight track to a curve, or from a curve to a straight track?

A. No, sir.

Int. 27. Has there been any complaint from the brakemen that the chains which wind upon the brake-shaft of the Springfield brake override each other, and thus destroy the effect of the brake on the wheels?

A. No, sir.

Int. 28. Has any accident happened on your train since the old Springfield brake was applied, in consequence of defective or inoperative brakes?

A. No, sir; not to my knowledge.

Int. 29. What is the average speed of your train?

A. About twenty-five miles an hour.

Cross-examined by S. D. Cozzens:

Cr.-int. 1. You say you think you can brake quicker with the old

Springfield brake than with the Tanner. Do you think there is more power in the Springfield brake, as arranged on the cars of the Boston and Providence road, than in the Tanner brake on that road?

A. Yes, sir.

Cr.-int. 2. It is a pretty good brake, is it, the Springfield brake?

A. I consider it a very good brake; a safe brake.

G. F. LINCOLN.

Deposition of H. M. Rogers.

Int. 1. What is your name, age, residence, and occupation?

A. H. M. Rogers; age, 31; residence, Boston; occupation, brakeman on the Boston and Providence Railroad.

Int. 2. How long have you been brakeman on the Boston and Providence Railroad?

A. I have been braking on that read two years and a half, and on the Albany a year.

1990 Int. 3. What train do you run on as brakeman?

A. The 10.30 from Boston and 4.15 from Providence.

Int. 4. The same as is run by M'r Lincoln, as conductor?

A. Yes, sir.

Int. 5. What brakes are in use on the train which you run as brakeman?

A. The Hodge brake, the Springfield brake, and the Tanner brake.

Int. 6. You speak of the Springfield brake and the Tanner brake; how long have these brakes been in use on this train?

A. They were put on in December, if I recollect aright.

Int. 7. Has there been any modification in the Tanner brake since it was put on the first time?

A. There has.

Int. 8. At whose request?

A. M'r Sayles'.

Int. 9. How has the Tanner brake worked since the modification by M'r Sayles?

A. It has worked better than it did the first time.

Int. 10. How, as a general thing, has the old Springfield brake worked since it was put on?

A. Well, it has worked very well.

Int. 11. To which do you give the preference, if indeed you have any?

A. The Springfield brake.

Int. 12. Please give your reasons for this preference?

A. Because it will hold better.

Int. 13. On what cars of the Boston and Providence road is the old Springfield brake used?

A. On No. 12 and No. 40.

Int. 14. And on what car the Tanner brake?

A. No. 10.

Int. 15. Which of these brakes have you run in the rear of the train, first and last?

A. We have run all of them, not giving one the preference more than the other.

Int. 16. With which brake can you slide the wheels the quickest and easiest?

1991 A. There is only one brake that I have ever slid the wheels with on that train, and that is the Springfield. I don't say anything about the Hodge brake.

Int. 17. When the engine is cut off to receive the Taunton and New Bedford train, on what car and what brake do you rely to stop the whole train at Mansfield?

A. They have used the three—Nos. 12, 40, and 10.

Int. 18. That is, both the Springfield and Tanner brake?

A. Both the Springfield and Tanner brake.

Int. 19. Which brake did you use the last time you ran a train over the road, switching into Mansfield?

A. No. 12, last Tuesday night.

Int. 20. Have you any particular choice whether you use No. 12, Springfield, or No. 10, Tanner?

A. Yes, sir; I have a preference.

Int. 21. Why?

A. As I said before, because the Springfield will hold better.

Int. 22. Have you had any trouble with the chains on the old Springfield brake overriding each other, or toggling upon each other, and thus destroying the efficiency of the brake?

A. No, sir.

Int. 23. Have you observed the operation of this brake when the train is running under the brakes, from a straight track on to a curve, or from a curve on to a straight track; if you say you have, state your observation?

A. I have seen no difference whatever. If there is any difference, it is so slight I cannot perceive it.

Int. 24. Please state whether, in your judgment, the old Springfield brake, properly adjusted, and the wear of the shoes taken up, is a safe brake to be used in stopping a railroad train?

A. There is no doubt in my mind that it is, so far as I have used the brake.

Cross-examined by M'r Cozzens:

Cr.-int. 1. When did you first know what the Tanner brake was?

1992 A. When it was put on by M'r Sayles.

Cr.-int. 2. That is the first you had ever heard of it?

A. That is the first I had ever heard of it.

Cr.-int. 3. What has led you to take notice as to the comparative working of the Springfield and Tanner brakes on this train?

A. I don't know but you might think it a little mite saucy for me to answer that, but I should tell you common sense—working the brake. The Springfield brake would hold so much better; the Tanner brake would not hold at all. The way it was first put on, I could not stop the train with it.

Cr.-int. 4. Do you know who put it on in that way at first?

A. I can't say who put it on first; but I have understood M'r Lightner did it.

Cr.-int. 5. He is car master of the road, is he?

A. Yes, sir.

Cr.-int. 6. Has anybody connected with the road directed or requested you to notice the relative manner in which the brakes work?

A. No, sir.

Cr.-int. 7. When did you first know what the Springfield brake was

A. When it was first put in the train last winter.

Cr.-int. 8. You had never heard of that brake before, had you?

A. No, sir.

Cr.-int. 9. Who first told you it was the Springfield brake?

A. M'r Whipple.

Cr.-int. 10. How long was that after it had been put on the train?

A. I don't know as I could say; soon after it.

Cr.-int. 11. Did M'r Whipple tell you whether it was a good brake or not?

A. He did not.

Cr.-int. 12. What did he say about it?

1993 A. He said there was a brake on for me to try, and he wanted me to use it. That was all there was said about it. At first, he said nothing. When the brake was first put on I knew nothing about what it was put on for, until we used it; and it was some week or fortnight after that before I knew what it was. It was put on there to use and see how it would work.

Cr.-int. 13. Do you know what the company wanted to see how it would work for?

A. I did not, at the time.

Cr.-int. 14. Do you now?

A. No; I don't know as I do.

Cr.-int. 15. What do you suppose it was for?

A. I can't say, sir.

Cr.-int. 16. What did you mean when you said that you did not at the time know?

A. Well, I didn't exactly mean that at the time. I said I knew nothing what it was put on for, and I don't. I have merely heard it talked around outside—that is all. I paid no attention to it, whatever.

Cr.-int. 17. Did you ever hear there was any suit about the Tanner brake?

A. I have only heard it talked around. No, I didn't.

Cr.-int. 18. You just said you heard it talked round. What do you mean by that?

A. I merely heard it talked round. No one came to me that I supposed knew any more about it than I did; merely the men round—that was all.

Cr.-int. 19. You have heard there was a suit about the Tanner brake?

A. Yes, sir.

Cr.-int. 20. How soon after the Springfield and Tanner brakes were put on this train, did you first hear there was a suit about the Tanner brake?

A. I can't tell you.

Cr.-int. 21. A week, a month, three months, or what?

A. Probably two or three months.

Cr.-int. 22. Of the two cars which had the Springfield brake on, which worked the best?

A. I saw no difference, sir, whatever, in them.

1994 Cr.-int. 23. Do you think there is more power in the Springfield brake, as arranged on the Boston and Providence cars, than in the Tanner brake, as arranged there?

A. I do, sir.

Redirect:

Int. 25. Why do you think there is more power in the Springfield brake than in the Tanner brake?

A. Well, all I can say is, as I said before, it will hold better.

H. M. ROGERS.

Deposition of Benj. C. Read.

Int. 1. What is your name, age, residence, and occupation?

A. Benj. C. Read; age, 49; residence, Bristol Co., Mass.; occupation, car-builder on the Boston, Lowell and Nashua Railroad.

Int. 2. Do you have charge of the car department of that road?

A. I do at present.

Int. 3. How long have you had such charge?

A. The last fifteen years.

Int. 4. What brakes are used on the passenger cars of the Boston and Lowell road?

A. The Hodge.

Int. 5. Are you acquainted with what is called the old Springfield brake?

A. No further than what we applied it there in this present experiment.

Int. 6. To what extent did you apply it—to how many cars?

A. Four.

Int. 7. In what train are the cars run to which said brake was applied?

A. Lowell accommodation.

Int. 8. About what time did you make the application of the Springfield brake to the four cars, or to the whole train composed of four cars?

1995 A. In the month of January, 1872.

Int. 9. Who is conductor and who brakemen on that train?

A. M'r Blood is conductor, and M'r Emerson and M'r Wing are brakemen.

Int. 10. What is your estimate as to the weight of the cars composing this train?

A. The passenger cars weigh eighteen tons; the baggage car is not so heavy.

Int. 11. These four cars consist of what kind of cars?

A. Two first-class, a smoking-car, and baggage-car.

Int. 12. What would you estimate the weight of the four cars?

A. The smoking-car and the two first class cars would weigh eighteen tons each; the baggage-car would weigh about twelve tons.

Int. 13. Making in all, how many tons?

A. Sixty-six tons.

Int. 14. What would you estimate the weight of the engine and tender, which hauls this train?

A. It is about a 25-ton engine.

Int. 15. Making the whole weight of the train, what?

A. I am not positive whether the tender would be included in the weight of the engine or not. I know they are equipped ready for service when we weigh them. I should say the train would weigh, altogether, 100 tons at least.

Int. 16. In applying the Springfield brake to a whole train of cars, what modifications, if any, did you make, compared with "Defendants' Exhibit, large Springfield brake, 124?"

A. Well, we modified the levers by putting them inside of the truck, inside of the bar; and put the fulcrum on the bar opposite to the front lever in the exhibit, on the farthest end of the truck from the windlass, the same as in "Exhibit, old single brake."

Int. 17. Where did you put the other lever?

A. On the opposite end of the same truck.

Int. 18. And applied the levers in the same way on the other truck?

1996 A. The same on the other truck.

Int. 19. Then how did you connect these levers with the windlass or brake-shaft?

A. With two rods and two chains—just the same as in this model, substantially.

Int. 20. Please state whether, in your judgment, such modification as you have described in any way changes the character of the old Springfield brake?

A. I should think not. Whether the fulcrum was on the rod or on the bar, I should say the character of it was the same.

Int. 21. Please look at "Defendants' Exhibit, old Springfield tender-brake," and state whether, had you put the brake on as therein represented, it would have changed its character?

A. No; it is the same thing. It is a straight connection from one truck to the other. It would not change the character.

Int. 22. What further is necessary to make the said exhibit "Springfield tender-brake" a passenger-car brake?

A. To duplicate the same brake on the windlass at the other end of the car.

Int. 23. Does the position of the levers upon the brake-bars, or dispensing with one of the chains upon the windlass-staff, in any way change the character of the old Springfield brake? Whatever your answer may be, give the reason for it.

A. I should think it would not. With two chains, the same power is applied to the two points as it would be with one chain. There would be no difference, whether it was wound up with two chains or with one chain.

Int. 24. Please look at "Model A, E. Merwin, U. S. C." What brake do you call that?

A. This is the Springfield—the old brake.

Int. 25. Wherein does it differ from "Defendants' Exhibit, large Sringfield brake, 124," in the application of the levers?

A. The levers are inside of the truck, and the fulcrum is on the rod. The end of the lever is attached to the bar.

1997 Int. 26. Are the levers on the model placed inside of the bars of the truck or outside?

A. Inside on this model.

Int. 27. The difference is, that one represents the levers as set on the inside of the brake-bars, and the other represents them as set on the outside of the brake-bars.

A. That is all the difference I see.

Int. 28. What should you judge the radius of the curve on which the cars have to be run into the car-house at Boston, when detached from the engine?

A. I should think that curve was in the neighborhood of 400 feet. It is a very sharp curve.

Int. 29. So much so that you have had to put an inner rail down?

A. It requires a guard-rail to hold the wheels on.

Int. 30. Are you in the habit of letting this train of four cars into the car-house over that curve?

A. Yes, sir; in and out every day when they are run.

Int. 31. Please state whether you have experimented to see whether there was any letting off or binding of the trucks with the old Springfield brake in passing this curve?

A. None to affect the effectual operation of the brake.

Int. 32. What is the nature of the curve at Lowell, in passing into the upper station, over which this train has to pass?

A. There is a very sharp reverse curve there.

Int. 33. Have you observed the operation of the train going in there under brakes; and, if so, what was the result of such observation?

A. None to affect the operation of the brake further than when the brake was put on upon a straight line we observed there was more strain on it when the car stood on a curve; but none to break the chains or levers. But there was a visible strain on it.

Int. 34. Did it operate to check the train, or let it loose, in passing over this curve?

A. No, it did not.

Int. 35. Please look at "Defendants' Exhibit, large Tanner brake, 123," and state what part of the same is like "Defendants' Exhibit, large Springfield brake, 124."

1998 A. Why, the application of the levers is the same, with the addition of that centre lever. The operation, I think, is the same. I mean that they are essentially the same as the Springfield brake, except that centre lever. Take the centre-lever out, and make the connection through, and it would be essentially the Springfield brake. Turn that lever over, connect it with this rod, and brake from this end, and it would be the Springfield brake.

Int. 36. By what means is the power divided or equalized between the two trucks, in both exhibits?

A. In Exhibit 123, by the centre-lever; and in Exhibit 124, by a division of power. I don't see any division of power. It is connected at the windlass by the rods; you may call that a division of power with the rods. I do not see any division of power—not practically a division. It is divided between the two trucks from the windlass. It is all applied from the windlass, a single brake to each truck, making two single brakes operated together, if you choose to call it so.

Int. 37. Is there the same means of adjustment in the two brakes when applied to cars? If so, what are the means of adjustment?

A. With these brakes, the adjustment would be by regulating the length of the rods in either. They both require it.

Int. 38. By what means?

A. By a turn-buckle, or shortening in any other way.

Int. 39. What is the means of adjusting the wear of the brake in both exhibits?

A. By nuts on the rods, in connection with nuts on the bars.

Int. 40. What advantage, if any, has the Tanner brake over the Springfield brake in generating friction power?

A. I don't think it has any advantage. I should think the Springfield brake had a little advantage over the Tanner brake, as I see the operation of them. I think, by applying the same amount of power to the Springfield brake, it would make the wheels slide a little quicker, because the same lever would apply a little more power to the wheel.

1909 Cross-examined by M'r Cozzens:

Cr.-int. 1. At what speed do the cars usually run over that curve at the Boston depot that you have spoken of?

A. They might run at the rate of eight miles an hour.

Cr.-int. 2. And about at what speed over the curve at Lowell you speak of?

A. I should think they would run eight there.

Cr.-int. 3. About what is the average speed of freight-trains in New England?

A. It is different on different roads. Some run one, and some another. Twelve miles an hour is considered a fair rate of speed.

Cr.-int. 4. How generally is the Hodge brake used throughout the New England States, as far as you know?

A. That is the general brake in use.

Cr.-int. 5. You do not know of any single brakes being used in New England on passenger-cars?

A. No, sir.

Cr.-int. 6. Or any cars running in passenger-trains?

A. Yes, sir; when they run freight-cars.

Cr.-int. 7. I mean on baggage or smoking cars?

A. No, sir.

Cr.-int. 8. In one of your early answers you said you had no more knowledge of the Springfield brake than what you had learned of it "in this present experiment." What do you refer to, when you say "this present experiment"?

A. To see whether the Springfield brake would stop a train or not.

Cr.-int. 9. As quick as the Tanner?

A. As quick as the Tanner or any other.

Cr.-int. 10. That is the experiment which has been going on on the Boston and Lowell road as to the Springfield brake?

A. Yes; if you call it an experiment.

Cr.-int. 11. Do you call it an experiment?

A. No; not hardly. I should call it a test, because it had been experimented years ago.

Cr.-int. 12. When was it experimented years ago?

2000 A. Before they had a better one to use.

Cr.-int. 13. Where?

A. On the Boston and Albany Railroad. I presume that is where the brake was originated.

Cr.-int. 14. Please state what are the lengths of the respective arms of the truck-levers in the Springfield brakes, as you have applied them in the cars of the Boston and Lowell Railroad?

A. The long arm is 30 inches; the short arm, 6 inches. The windlass shaft, at the part where the chains winds, is an inch and a half in diameter; and the windlass-wheel is 16 inches, the same as the model.

Cr.-int. 15. What is the length from the centre of the windlass-shaft to the centre of the hole in the truck-lever of the short rod and chain in the Springfield brakes, as now rigged on the Boston and Lowell road?

A. It would be 12 feet. That includes from the windlass up to the end of the lever.

Cr.-int. 16. What is the length between the centres of the windlass shafts from one end of the car to the other, on the car on which the Springfield brake is placed on the Boston and Lowell road?

A. Fifty feet. That is, it is a fifty-foot car. That includes the platform. I mean from one staff to the other.

Cr.-int. 17. How long is the long chain on those cars from centre of windlass shaft to centre of the truck lever?

A. It would be, say, 47 feet.

Redirect:

Int. 41. I would like to inquire whether the Tanner brake is used on the passenger-cars of any road within your acquaintance?

A. No; none within my knowledge.

BENJ. C. READ.

2001 *Deposition of John C. Blood.*

Int. 1. What is your name, age, residence, and occupation?

A. John C. Blood; 36 years of age; residence, Lowell; occupation, conductor on the Boston, Lowell and Nashua Railroad.

Int. 2. How long have you been conductor on that road?

A. Seven years the 25th day of last June.

Int. 3. What train do you run? By what name is it known?

A. The Boston and Lowell accommodation-train.

Int. 4. How many trips a day does it make?

A. It makes two round trips; four times over the road.

Int. 5. What is the distance between Boston and Lowell?

A. A fraction less than 26 miles.

Int. 6. What time do you have to run that train in?

A. The first train from Lowell in the morning is one hour and five minutes. The first train out of Boston, at 10 o'clock, is an hour and ten minutes. The second train out of Lowell is an hour and twelve minutes. The second train out of Boston is an hour and four minutes.

Int. 7. How many cars usually compose the train when you leave Lowell?

A. Two passenger-cars, a smoking-car, and baggage-car.

Int. 8. How many cars compose the train leaving Boston?

A. Three passenger, a baggage, and smoking car; sometimes four passenger-cars. That is my regular train.

Int. 9. What brakes are applied to what you call your regular train of four cars?

A. What they call the Springfield brake.

Int. 10. How long has that brake been applied to those cars?

A. I think it was put on some time in November; I don't know the date.

Int. 11. Have you run that train of four cars from the time it was put on to the time of leaving to come to this place?

A. I have not.

2002 Int. 12. How much time do you deduct from the whole time?

A. I can't tell you.

Int. 13. What portion of the whole time have you probably run it?

A. The greater portion.

Int. 14. How many stations are there upon the line of road at which you have to make stops?

A. I am liable to make 16 or 17 stops. Generally from 5 to 17 stops.

Int. 15. And you are required to do this in an hour and five minutes?

A. Yes; but the longest trip, when I have the most stops, I am allowed an hour and twelve minutes. Some of those are stops that I make between stations, or where I have to stop—flag-stations.

Int. 16. Are any of the stations located on curves?

A. Yes, sir.

Int. 17. How many?

A. North Billerica is on a curve; at Wilmington we strike a curve—we are on a curve when we are breaking up; at Woburn there is a curve, and also at East Cambridge. That would make four.

Int. 18. In running your train from Boston to Lowell you are obliged to make slow time, I take it, out of Boston, and *and* also into Lowell?

A. I am for the first mile, and nearly the last mile.

Int. 19. And so on returning; the first and last mile the other way is at what speed?

A. They usually tell them they want them to run six miles an hour. Sometimes they run faster and sometimes slower.

Int. 20. Notwithstanding the slow speed at the beginning and end of your run, you have to make the run in an hour and five minutes and an hour and twelve minutes, and make all the stops, whatever those stops may be?

A. Yes, sir.

Int. 21. Have you at any time during the running of this train 2003 taken it upon yourself to time the train, that is, to determine about how many seconds it takes to stop the train at each station and how long to get up speed after leaving a station?

A. I have, for about one week—six days.

Int. 22. What portion of those 26 miles did you have cars in the train equipped with other than the Springfield brakes?

A. Eight miles.

Int. 23. What brake did you have on the car or cars that you might have in the rear of the train for the first eight miles out of Boston?

A. What they call the Hodge brake.

Int. 24. After that you depended entirely on the Springfield brake on the four cars in the train going into Lowell?

A. I did.

Int. 25. And returned from Lowell to Boston with no other brake than the Springfield brake?

A. One train I had others attached, and one I had none.

Int. 26. Will you now please state, and have it recorded, the time which you made from day to day, for the six days you timed the train, with such remarks as you may think the case calls for?

A. I merely took the time for my own information. I did not expect that I should have to use it again. July 23 my delay coming out of Lowell at the Northern depot was two minutes and a half. I mean by delay the time the train remains standing. I don't know the time of stopping, because we have to run slow to the Northern depot.

From Lowell:

	Stopping.		Delay.
Bleachery	45 secs.		30 secs.
North Billerica	45 "		45 "
Billerica	50 "		30 "
Wilmington	50 "		30 "
Woburn*	60 "	5 min.	30 "
East Woburn	35 "		10 "
Winchester	50 "		50 "
Medford	45 "		30 "
College Hill	45 "		10 "
	Stopping.		Delay.
2004 Somerville Centre	45 secs.		10 secs.
East Cambridge	45 "		15 "

Time, 3.27, leaving Lowell at 2.15.

From Boston, 4 p. m.:

East Cambridge†	70 secs.	80 secs.

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* Watering-station, where we have to run slow to make a stop and take water, and on the sharp curve under the arch.

† Here we have to run up slow through the yard, and make a stop on up-grade, crossing a number of streets.

	Stopping.	Delay.
Somerville Centre	50 secs.	60 secs.
Medford	45 “	60 “
Winchester	50 “	120 “
Woburn	55 “	60 “
North Woburn	50 “	20 “
North Billerica	45 “	120 “
Bleachery	45 “	15 “

Arrived at Lowell at 5.04.

WEDNESDAY, *July* 24.

From Lowell, 7 a. m.:

	Stopping.	Delay.
Northern Depot	..	3 min.
East Woburn	60 secs.	3 “
Winchester	60 “	2 “
Medford	45 “	60 secs.
East Cambridge	45 “	30 “

Arrived at 8.05.

From Boston, 10 a. m.:

	Stopping.	Delay.
East Cambridge	50 secs.	90 secs.
Milk Row	40 “	15 “
Winter Hill	45 “	30 “
Somerville Centre	25 “	.. “
College Hill	45 “	10 “
Medford	35 “	30 “
Winchester	60 “	40 “
East Woburn	55 “	10 “
Woburn	40 “	30 “
North Woburn	40 “	10 “
Wilmington	50 “	15 “
Billerica	55 “	25 “
North Billerica	50 “	20 “
Bleachery	45 “	10 “

Arrived at Lowell 11.10.*

2005 From Lowell, 2.15 p. m.:

	Stopping.	Delay.
Northern Depot	120 secs.	..
North Billerica	55 “	40 secs.
Billerica	50 “	20 “
Wilmington	55 “	15 “
North Woburn	45 “	25 “
Woburn	55 “	4 min. 30 “
East Woburn	45 “	15 “
Winchester	45 “	35 “
Medford	50 “	40 “
College Hill	50 “	45 “
Somerville Centre	50 “	10 “
East Cambridge	60 “	35 “

Arrived at 3.27.

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* This is as near as I could take it with my watch, not having a stop-watch. I merely did it for my own satisfaction.

From Boston, 4 p. m.:

	Stopping.	Delay.
East Cambridge	60 secs.	30 secs.
Milk Row	45 "	15 "
Somerville Centre	40 "	30 "
Medford	40 "	40 "
Winchester	35 "	40 "
Woburn	45 "	40 "
North Woburn	55 "	..
North Billerica	45 "	30 "
Bleachery	50 "	..

Arrived at 5.04.

THURSDAY, *July* 25.

From Lowell, 7 a. m.:

	Stopping.	Delay.
Northern Depot	..	120 secs.
East Woburn	60 secs.	120 "
Winchester	60 "	150 "
Medford	50 "	35 "
East Cambridge	45 "	30 "

Arrived at 8.05.

From Boston, 10 a. m.:

East Cambridge	50 secs.	60 secs.
Winter Hill	40 "	35 "
College Hill	35 "	20 "
Medford	35 "	30 "
Winchester	40 "	70 "
East Woburn	45 "	30 "
Woburn	40 "	20 "
2006 North Woburn	45 secs.	15 secs.
Wilmington	45 "	55 "
Billerica	45 "	45 "
North Billerica	50 "	25 "
Bleachery	50 "	10 "

Arrived at 11.10.

From Lowell, 2.15 p. m.:

Northern depot	..	3 min.
Bleachery	35 secs.	10 secs.
North Billerica	45 "	40 "
Billerica	35 "	20 "
Wilmington	45 "	30 "
Woburn	60 "	5 min.
East Woburn	40 "	10 secs.
Winchester	45 "	40 "
Medford	45 "	35 "
College Hill	45 "	15 "
Somerville Centre	50 "	10 "
East Cambridge	55 "	40 "

Arrived at Boston at 3.27.*

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* Five cars and three brakemen. The fifth car had a Hodge brake.

From Boston, 4 p. m.:

	Stopping.	Delay.
East Cambridge	60 secs.	30 secs.
Milk Row	45 "	10 "
Somerville Centre	40 "	20 "
Medford	35 "	30 "
Winchester	40 "	70 "
Woburn	40 "	30 "
Bleachery	80 "	..

Arrived at Lowell, 5.03.

FRIDAY, *July* 26.*

From Boston, 10 a. m.:

	Stopping.	Delay.
East Cambridge	60 secs.	30 secs.
Winter Hill	40 "	20 "
College Hill	45 "	30 "
Medford	45 "	20 "
Winchester	45 "	30 "
Woburn	40 "	20 "
Wilmington	40 "	20 "
Billerica	45 "	60 "
2007 North Billerica	45 secs.	20 secs.
Bleachery	50 "	10 "

Arrived at 11.10.

From Lowell, 2.15 p. m.:

Northern depot	..	2 min.
Bleachery	30 secs.	15 secs.
North Billerica	40 "	30 "
Billerica	40 "	20 "
Wilminton	50 "	30 "
Woburn	60 "	5 min.
East Woburn	40 "	10 secs.
Winchester	50 "	20 "
Medford	60 "	30 "
College Hill	40 "	10 "
East Cambridge	55 "	30 "

Arrived at 3.27.†

From Boston, 4 p. m.:

East Cambride	60 secs.	40 secs.
Somerville Centre	35 "	30 "
Medford	40 "	20 "
Winchester	40 "	30 "
Woburn	40 "	15 "
North Woburn	35 "	10 "
North Billerica	50 "	10 "
Bleachery	45 "	10 "

Arrived at 5.04.

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* I was quite busy, and did not take the morning train down.

† This day we had a wet rail, which makes some difference.

SATURDAY, *July* 27.

From Lowell, 7 a. m.:

	Stopping.	Delay.
Northern depot	..	60 secs.
Woburn	50 secs.	10 "
East Woburn	50 "	120 "
Winchester	45 "	120 "
Medford	45 "	20 "
East Cambridge	50 "	15 "

Arrived at Boston at 8.05.

From Boston, 10 a. m.:

East Cambridge	45 secs.	20 secs.
Milk Row	40 "	50 "
Winter Hill	35 "	15 "
College Hill	35 "	15 "
2008 Medford	40 secs.	20 secs.
Winchester	45 "	50 "
East Woburn	40 "	25 "
Woburn	45 "	20 "
North Woburn	40 "	15 "
South Wilmington	40 "	..
Wilmington	40 "	30 "
Billerica	45 "	30 "
North Billerica	40 "	45 "

Arrived at 11.08.

From Lowell, 2.15 p. m.

Northern depot	..	120 secs.
Bleachery	35 secs.	15 "
North Billerica	40 "	20 "
Billerica	45 "	25 "
Wilmington	50 "	15 "
Woburn	60 "	5 min.
East Woburn	45 "	15 secs.
Winchester	50 "	20 "
Medford	45 "	30 "
College Hill	45 "	15 "
East Cambridge	45 "	30 "

Arrived at Boston, 3.29.

From Boston, 4 p. m.:

East Cambridge	50 secs.	80 secs.
Somerville Centre	40 "	20 "
Medford	45 "	20 "
Winchester	40 "	55 "
Woburn	40 "	45 "
North Woburn	45 "	10 "
North Billerica	50 "	30 "

Arrived in Lowell at 5.02.*

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* I did not take any record of the next day, which would be Monday; but my 4 p. m. train went from Boston to Lowell, and made thirteen stops, in an hour and four minutes.

TUESDAY, *July* 30.

From Lowell, 7 a. m.:

	Stopping.	Delay.
Northern depot	..	90 secs.
East Woburn	45 secs.	4 min.
Winchester	50 "	120 "
Medford	45 "	30 "
East Cambridge	45 "	20 "

Arrived in Boston at 8.08.

2009 From Boston, 10 a. m.:

	Stopping.	Delay.
East Cambridge	50 secs.	30 secs.
Winter Hill	35 "	20 "
Medford Steps	35 "	10 "
Medford	40 "	15 "
Winchester	45 "	60 "
East Woburn	40 "	20 "
Woburn	40 "	25 "
North Woburn	40 "	20 "
South Wilmington	40 "	15 "
Wilmington	40 "	20 "
Billerica	45 "	30 "
North Billerica	50 "	40 "

Arrived in Lowell at 11.10.

From Lowell, 2.15 p. m.:

Northern Depot	..	120 secs.
Bleachery	45 secs.	..
North Billerica	45 "	50 "
Billerica	45 "	30 "
Wilmington	50 "	30 "
North Woburn	30 "	50 "
Woburn	50 "	5 min.
East Woburn	40 "	15 secs.
Winchester	35 "	90 "
Medford	40 "	20 "
East Cambridge	40 "	35 "

Arrived at Boston, 3.27.

From Boston, 4 p. m.:

East Cambridge	50 secs.	25 secs.
Milk Row	40 "	..
Somerville Centre	40 "	30 "
College Hill	35 "	10 "
Medford	40 "	45 "
Winchester	35 "	45 "
Woburn	35 "	30 "
North Woburn	40 "	10 "
Wilmington	35 "	30 "
North Billerica	40 "	20 "
Bleachery	45 "	15 "

Arrived at Lowell at 5.04.

In taking the time, I set down only the five seconds. If the fraction was less than three, I took no account of it; if three or more, I called it five, which would be about an even thing.

2010 Int. 27. Please state the number of seconds, according to your record, it took your engineer to get up speed from the time he started his engine.

A. That question I am not able to answer.

Int. 28. According to your best judgment?

A. It is hard telling when an engine gets its speed. No man can answer that question.

Int. 29. I will put the question in another way. How many seconds did you consider that he consumed in getting up the speed run to make this time?

A. It would be all the way from a minute and a half to three minutes, according to the grade and the speed he had to run to get to the next station. Some of our stops would come within half a minute's run of each other, if we were running at speed.

Int. 30. How long should you judge, on the average, it took you to make the stops from one end of your route to the other?

A. I have not added it up yet. The reason I took these minutes was, I thought they might be valuable for reference some time, for my own benefit, or to satisfy my curiosity rather.

Int. 31. Who were brakemen on this train in which you made this time?

A. Alpheus Wing and John D. Emerson.

Int. 32. Did you rely upon the old Springfield brake to bring your train to rest?

A. I did.

Cross-examined by M'r Cozzens:

Cr.-int. 1. Do you consider the Springfield brake a first-rate brake?

A. I do. I know it does its work. I have not used brakes enough to know whether it is the best brake; but I consider that it has done the work on my train.

JOHN C. BLOOD.

2011 *Deposition of Alpheus Wing.*

Int. 1. What is your name, age, residence, and occupation?

A. Alpheus Wing; age, 35; residence, Lowell; occupation, brakeman on the Boston, Lowell and Nashua Railroad.

Int. 2. How long have you been brakeman on that road?

A. I have been brakeman on the road and its branches about four years.

Int. 3. On what train are you brakeman now?

A. M'r Blood's train.

Int. 4. When does said train leave Lowell, and when Boston?

A. It leaves Lowell at 7; Boston at 10; Lowell at 2.15, and Boston at 4.

Int. 5. Were you one of the brakemen for M'r Blood at the time he timed the train, noting the number of seconds in which the stops were made?

A. I was on at that time; yes, sir.

Int. 6. Have you about concluded your services on that road as brakeman?

A. I expect I have.

Int. 7. What position do you expect to occupy hereafter?

A. I expect to be in the depot.

Int. 8. In what capacity?

A. Assistant depot-master.

Int. 9. How long have you been brakeman on this train of M'r Blood?

A. Two years and six months.

ALPHEUS WING.

Deposition of John D. Emerson.

Int. 1. What is your name, age, residence, and occupation?

A. John D. Emerson; 35 years old; residence, Lowell, Mass.; occupation, brakeman on the Boston and Lowell Railroad.

Int. 2. How long have you been brakeman on that road?

2012 A. About a year and a half.

Int. 3. And how long on M'r Blood's train?

A. Since last October.

Int. 4. Do you act as rear or forward brakeman?

A. Rear.

Int. 5. And have you been a brakeman almost all the time on that train since last October?

A. I have.

Int. 6. Were you on it at the time when M'r Blood made a record of the time of the stops?

A. I was.

Int. 7. And you broke the two cars in the rear of the train?

A. Yes, sir.

Int. 8. Were the cars on that train equipped with what is called the old Springfield brake?

A. Yes, sir.

Int. 9. Two chains winding on either windlass?

A. Yes, sir.

Int. 10. Have you concluded your service as brakeman on that road?

A. I have.

Int. 11. In what capacity do you expect to be employed hereafter?

A. Conductor.

Int. 12. On what road?

A. Boston and Lowell Railroad.

JOHN D. EMERSON.

Deposition of Robert Hitchcock.

Int. 1. What is your name, age, residence, and occupation?

A. My name is Robert Hitchcock; age, 43; residence, Springfield; occupation, building and repairing cars for the Connecticut River Railroad Company.

Int. 2. Have you charge of the car department of that road?

2013 A. I have.

Int. 3. How long have you had such charge?

A. Since June, 1856.

Int. 4. Are you acquainted with the construction and operation of railroad-car brakes?

A. I am.

Int. 5. With what brakes are you acquainted?

A. With what is styled the old single brake, the old Springfield brake, the Tanner, Hodge, and Stevens brakes.

Int. 6. You name the old Springfield brake; how long have you been acquainted with it, and when did you first know it?

A. I have been acquainted with it since 1846. I first knew it in the fall of 1846, on what is now termed the Boston and Albany road, in this city.

Int. 7. Where did you see it; on what car or cars, if at all?

A. I saw it on the tenders of locomotives.

Int. 8. You will please look at "Defendants' Exhibit, old Springfield tender-brake," and state whether that is a correct representation of the application of the brake, as you saw it in 1846 and thereafter.

A. It is.

Int. 9. Is the application of the levers to the truck-bars the same now as then, or have they been modified?

A. In principle it is the same, but the fulcrum of the lever is not now put upon the bar instead of the short arm. In other words, the lever is now placed at the end of the truck furthest from the windlass instead of where it was originally, at the end of the truck nearest the windlass. It was my business to work upon those tenders at that time, and we placed the lever at the end of the truck nearest the windlass, on both sides of the bar, and also with its fulcrum in both places, one way on the bar, and the other way on the lever.

Int. 10. What brake is in general use on the Connecticut River Railroad?

A. The Hodge brake.

Int. 11. Have you in use the old Springfield brake; and, if so, to what extent?

2014 A. We have it in use upon four cars.

Int. 12. Any Tanner brakes in use?

A. We have one car.

Int. 13. Will you please describe the manner of applying the levers to the bars of the trucks in the application of the Springfield brake to the cars of that road?

A. On one car it is precisely the same as this "Model A, E. Merwin, U. S. C." Upon the other three cars the levers are applied the same as in "Defendants' Exhibit, old single brake"; that is, the levers to which the short chains run are placed at the end of the trucks furthest from the windlass. In all respects it is like "Defendants' Exhibit, old Springfield brake, 124," with the exception that the fulcrums of the levers are placed upon the truck-bars instead of the short arms, like said exhibit old single brake.

Int. 14. What is the estimated weight of the four cars to which this brake was applied, and also the weight of the engine and tender which were and are used to haul the train?

A. Seventy tons and 390 pounds is the actual weight of the cars; the weight of the engine and tender is thirty-eight tons and ten pounds; making the whole train weigh a little over 108 tons.

Int. 15. What name is given to the train equipped with this brake?

A. Sampson's train.

Int. 16. Where is it run?

A. It runs between Northampton and Springfield and between Chicopee Falls and Springfield.

Int. 17. Who is engineer?

A. Henry Wright was until quite recently. I don't know who is running it now. There have been different engineers.

Int. 18. Who are the brakemen?

A. William McCormick and Frank Bennett.

Int. 19. What is the radius of the sharpest curve on which this train runs, and where is it located?

A. 350 feet. It is located in this city, near the terminus of our track.

2015 Int. 20. Is it in the main track over which this train has to run in coming into the station in this city?

A. It is near the depot.

Int. 21. Has any complaint come to you that the chains which wind on the brake-shafts, in operating the brakes, overlap each other, and thus destroy the effective operation of the brake?

A. No, sir.

Int. 22. Can there be any overlapping of chains? If so, state under what circumstances, and what the remedy.

A. If the brake should be neglected, and the turn-buckle should turn back and lengthen the rod that connects the truck furthest from the windlass, the chains might possibly come down and overlap. It would be remedied by taking up the rod on which the turn-buckle is placed.

Int. 23. Is this brake any more liable to be complained of than any other brakes, such as the single brake, Tanner brake, and Hodge brake?

A. No, sir.

Int. 24. Of all brakes, which do you have the most complaint from?

A. Well, I don't know. They complain of all brakes. They complain of the Hodge at times, and of the Stevens. I never have heard any complaint, however, of this brake, the Springfield; but there are circumstances or times when brakemen will complain of brakes when there is no necessity for it.

Int. 25. Will you please look at "Defendants' Exhibit, large Springfield brake, 124," and state what is the prominent characteristic of that brake, that which distinguishes it from all others?

A. It is the combination of the levers in both trucks with each other and with the windlass on the car body in opposite directions.

Int. 26. Please state what you mean by "opposite directions."

A. I mean that it has two systems, one operating from one end of
the car, and the other from the other; two levers being connected
2016 with one windlass, and two with the other, in opposite directions,
but in the same relative position, the pairs operating independently of each other.

Int. 27. Would you note the same characteristic in the said exhibit should you connect the levers in the trucks with each other, and then with the windlass, by one chain?

A. I should.

Int. 28. Having one chain or two chains does not change the characteristic of the brake?

A. No, sir, not at all.

Int. 29. You will now please look at Defendants' Exhibit, large Tanner brake, 123, and state what its leading characteristic is.

A. It is characterized by connecting the levers between the trucks by the use of a centre-lever.

Int. 30. Do you mean the power between the trucks or truck-levers on the trucks by means of a centre-lever?

A. Yes, the connecting levers.

Int. 31. And through the centre-lever with the windlass of the car?

A. Yes, sir.

Int. 32. Does it alter the characteristic of either of these brakes whether you put the fulcrum of the truck levers on the bar or the short arm of the bar?

A. No, sir.

Int. 33. Or whether you put the lever inside or outside of the bar?

A. No, sir.

Int. 34. You will please answer the same question as to the leading characteristic of the Hodge brake.

A. The Hodge brake equalizes the power between the trucks.

Int. 35. By what means?

A. By the use of two levers, which are suspended upon movable links.

Int. 36. Wherever you find the Hodge brake, do you always find this characteristic of the two truck-levers being connected by two equalizing levers, suspended on links?

A. Always.

Int. 37. It makes no difference, then, about the arrangement of the levers in the truck?

2017 A. Not at all.

Int. 38. What is the leading characteristic of the Stevens brake? What is that a combination of; and how are the parts worked?

A. It is a combination of the four levers of the old Springfield brake with each other and with the windlasses on the car body.

Int. 39. And operated how?

A. It operates in one system, from either end of the car.

Int. 40. While the Springfield brake is operated as two systems, or in pairs, from either end of the car?

A. Yes, sir.

Int. 41. Can the old Springfield brake be converted into a Stevens brake?

A. It can.

Int. 42. Look at Defendants' Exhibit, old Springfield brake, 124, and if you think you can convert it into a Stevens brake, do so, and state while doing it the process in detail.

A. I first disconnect the levers between the trucks from the windlass. I will now proceed to connect the fulcrums of the levers in the trucks. I will now connect the two levers between the trucks with each other.

Int. 43. And then what do you have?

A. I have the Stevens brake.

Int. 44. Were you a witness to certain experiments with the Tanner brake some time last November?

A. I was.

Int. 45. Please state in general the object of the experiments.

A. The object was to prove the difference between the same power applied to a brake-wheel upon four wheels and upon eight.

Int. 46. You will now please state in detail how that object was carried out.

A. We took a car with the Tanner brake applied the same as on Exhibit 123. We went to a point marked by a bridge, using 120 pounds
steam pressure. We had a brakeman, a helper, and myself. We
2018 attained the highest speed that we could in running a certain dis-
tance, which was marked by a switch. We estimated the speed
at twenty-five miles an hour. At this switch we sounded the whistle; the brakeman was at his post, the man ready to draw the pin simultaneously, and the brake was applied—first with the Tanner brake, as it now stands in that exhibit. We ran I do not know how many feet, but we marked the place where we stopped. We then converted the brake

into what is termed the old single brake, by disconnecting the lever of one truck from the centre lever. We went over the ground again, all things being equal, and stopped very nearly in the same place. I think we passed about somewhere in the neighborhood of the length of the car further. We were surprised ourselves in one sense; and we tried the experiment again the same way, with just about the same results. We then coupled it up, making the Tanner brake good again, and went over the ground once more. The same instructions were given to the brakeman in each case, and all the conditions the same, and about the same results were obtained that we did with the first trial of the Tanner brake.

Int. 47. What conclusion, if any, did you deduce from these experiments?

A. We made up our minds that the friction was due to the weight or pressure more than to the amount of surface that it covered.

Int. 48. That is, that the law of generating friction is as the pressure, not as the surface pressed on?

A. Exactly. When operated as a single brake, the wheels slid a little ways. The brakeman was a common man, not acquainted with applying brakes. All that he could do was to exhaust his force upon the windlass. If he had, at the point where the wheels began to slide, let up on his chain, I think that the result would have been the same as with the Tanner brake, or nearer than it was. I became satisfied that if a man exhausts his force upon a single brake, and does not slide the wheels, he does just as much service as he does when he exhausts his force under the same conditions on the double brake, not sliding the wheels.

2019 Int. 49. In applying friction to car-wheels, for the purpose of stopping the car, are the wheels ever made to slide when the car is at high speed?

A. No, sir; that is impossible.

Int. 50. When do they, if ever, slide?

A. When the car is nearly at rest.

Int. 51. Then do I understand you, that the conclusion arrived at from these experiments was, that a brake is doing just as effectual service so long as the wheels are in motion with a certain power, whether applied to four wheels or eight wheels, so long as the wheels are not brought to rest?

A. That was my conclusion.

Int. 52. You will now please look at "Defendants' Exhibit, large Tanner brake, 123," and wind up the larger windlass until the scales in each truck indicate 48 pounds, and set down the dog in the ratchet. (Witness did as directed.) You will now take "Exhibit, round scale," and apply it to the periphery of the wheel, and state how many pounds it takes to lift the dog from the ratchet.

A. Two pounds.

Int. 53. You will now disconnect one of the truck-levers from the centre-lever, thereby resolving the brake into a single brake, and turn up the smaller or twelve-inch windlass-wheel until it indicates 48 pounds in the truck to which the windlass is attached. (Witness complied with the request.) You will now apply to the periphery of said wheel "Exhibit, round scale," and state how many pounds it takes to relieve the dog in the ratchet.

A. Two pounds.

Int. 54. What conclusion do you deduce from the facts elicited by the two experiments?

A. That the power transmitted through a 16-inch wheel upon a double brake is equal to the power transmitted through a 12-inch wheel to a single brake.

Int. 55. Then is it proper or not to conclude, that no more power can be conveyed to a single truck by a 12-inch wheel than to the brakes of two trucks by a 16-inch wheel ?

A. It is proper.

Int. 56. Do you know of the use of the Tanner brake on the passenger-cars of any railroad ?

2020 A. I do not.

Int. 57. By what brakes has it been superseded ?

A. The Hodge and Stevens.

Int. 58. Please state, having reference to the "Tanner Patent Office Model," whether or not it would be practicable to apply the brake as therein represented to a car; and, if not, why not ?

(Counsel for plaintiff objected, on the ground that no such issue arises upon this accounting.)

A. It would not, because it has a compound lever, which would give us too much chain; likewise, too much power. If we should attempt to remedy the chain, we should have to increase the shaft on the windlass-wheel, but would not increase it sufficiently so but that we should slide the wheels. In the first place, we have a centre-lever which we take hold of from the windlass, equi-distant from its centre at either end. The power is transmitted to the lever of the truck by the shorter arm of the same lever. In other words, this result I speak of is due to the fact that the windlass rod takes hold of the centre-lever at the end of the latter, and the rod of the truck-lever goes from the centre-lever at a point which is nearer the fulcrum-pin than it is to the end of the centre-lever, as seen in said Patent-Office Model. That is why I think it would be impracticable to apply a brake to a car as in that model.

Int. 59. From the data already established, which mode of application, in your judgment, would slide the most wheels, the brake represented in the Patent-Office Model or the same power applied to the single lever of a single truck ?

(Counsel for plaintiff objected, upon the same ground as before.)

A. The brake in the Patent Office Model.

Cross-examined by Mr. Cozzens:

Cr.-int. 1. Which do you think is the best brake, the Hodge or the Stevens ?

A. The Hodge.

Cr.-int. 2. You made these two large wooden models, Springfield, 124, and Tanner, 123 ?

A. No, sir; but they were made in the shop I have charge of.

2021 Cr.-int. 3. What are the numbers of the cars on the Connecticut River road upon which the four Springfield brakes you have spoken of are placed ?

A. No. 4, baggage and smoking-car, passenger cars M, T, and U.

Cr.-int. 4. Which one of those has the brake like the "Model A, E. Merwin, U. S. C. ?"

A. Passenger-car M.

Cr.-int. 5. On this car M, how long are the respective arms of the truck-levers on the brake ?

A. The long arm is 30, and the short arm 6 inches.

Cr.-int. 6. On said car M, how long is the short chain and how long s the long chain, from centre of windlass-shaft to centre of top of ever ?

A. I cannot say exactly. I should say somewhere from four to five feet.

Cr.-int. 7. And how long the long chain and rod between the corresponding points?

A. In the neighborhood of 25 feet.

Cr.-int. 8. How long is the whole car between centres of windlass-shafts?

A. In the vicinity of 47 feet.

Cr.-int. 9. This car M, of course, has a platform at each end?

A. Yes, sir.

Cr.-int. 10. What is the width of the platform?

A. Two foot and a half from the standard back, or thereabouts.

Cr.-int. 11. Are you including this portion here of the frame with the platform?

A. Yes, sir; everything. I mean from the standard of the brake to the body of the car.

Cr.-int. 12. And the brake-wheel on that car is 16 inches in diameter, and the part of the windlass shaft where the chains wind is an inch and a half in diameter, is it?

A. I think they are.

Cr.-int. 13. Please give the same data as to cars U, T, and No. 4.

2022 A. The long arms of the truck-levers are 30, the short arms are 6 inches. The shorter chain and rod is 10 feet; the length of the longer chain and rod is 45 or 46 feet, or thereabouts.

Cr.-int. 14. Then, as I understand it, you mean that in this case the shorter chain and rod is about 10 feet, the longer chain and rod is about 25 feet, and the same for the longer chain and rod in the other case?

A. Exactly.

Cr.-int. 15. And the width of the platform?

A. The width of the platform is the same—two feet and a half.

Cr.-int. 16. What is the total length of the car-bodies, U, T, and No. 4, between centres of windlass-shafts?

A. About 50 feet.

Cr.-int. 17. What is the length of the trucks of those four cars, M, T, U, and No. 4?

A. Nine feet seven inches. They are all the same.

Cr.-int. 18. Please to state the total lengths of the car-sills, exclusive of the platforms and bunter-beams.

A. The M car is 42 feet; U and T 45 feet, or thereabouts; No. 4 is 45 feet.

Cr.-int. 19. How much do you allow for the width of platforms and bunter-beams at each end of those cars?

A. Two feet and a half.

Cr.-int. 20. What other cars, if any, run in these trains with the cars having the Springfield brakes on?

A. There are no others.

Cr.-int. 21. This train has all Springfield brakes?

A. Yes, sir; if any other one gets in it is by accident. On extra occasions, if we have occasion for an extra car, we have no others equipped with that brake, and we hitch on another car without reference to it; but it is rarely if ever done.

Cr.-int. 22. Do all these cars which you say have the Springfield brake on them run regularly together in one train?

A. Not all the time. They do when we require them all; when we require as many cars as four. Three cars is the regular train as a rule.

2023 Cr.-int. 23. Have at least three of these cars, fitted with the Springfield brakes, run regularly in this train?

A. Yes, sir.

Cr.-int. 24. For how long a time?

A. Since some time in November up to the present.

Cr.-int. 25. At least three have run regularly in that train during all of that period?

A. It may be possible we have had one of them in the shop to varnish the car.

Cr.-int. 26. Then you would put on the other one, wouldn't you? I am not particularizing the cars, but you run three cars regularly?

A. Yes, sir; we run three cars.

Cr.-int. 27. Which is uppermost, the long chain and rod or the short chain and rod?

A. The short chain and rod, I think. I am not positive, but I think it to be so.

Cr.-int. 28. Will you please state whether you have any corrections to make in your testimony in regard to the length of the short chains and rods of the Springfield brakes on one or more of the cars of the Connecticut River Railroad?

A. I have a correction to make. The length is from 12 to 12½ feet.

Redirect:

Int. 60. Were you ever in the employ of the Western Railroad Company, now the Boston and Albany?

A. I was.

Int. 61. When did you first come into the employ of said Western Railroad Company?

A. In the fall of 1846.

Int. 62. At the time that you came into such employ were you acquainted with the tenders then in use on that road and the application of brakes to the same?

A. I was.

Int. 63. How did you find the application of the levers to the trucks on the different tenders?

A. Some, I think, were precisely the same as this model, "Defendant's Exhibit, old Springfield tender-brake." Some, I think, 2024 had the first truck lever set on the bar the furthest from the windlass. Then they were connected in the same way they are in this exhibit.

Int. 64. Do you wish to be understood that the levers were set upon the bar the furthest from the windlass, the same as shown in "Defendants' Exhibit, old single brake;" and at what time did you see levers so applied upon tenders on the Western road?

A. I do. That was in the fall of 1846. I found them so when I came there.

Int. 65. Do you know how long they had been thus applied prior to your going?

A. I do not.

Int. 66. Are they applied now upon the tenders of that road the same as you saw them in 1846?

A. Some of them are; I can't say how many.

Int. 67. In the operation of the old Springfield brake upon the cars of your road to which it is applied have you noted that one of the windlass chains sometimes drops a little upon the standard in winding upon the same? If so, how does that affect the practical operation of the brake?

A. I have noticed on one car, No. 4, one of the chains dropping a little. I don't consider that it affects the operation of the brake at all, to injure it. If one chain falls down by being slack it tends to adjust it by shortening its length.

Int. 68. Would this be the case if the chains and rods were adjusted alike, so as to apply the power equally on each truck?

A. No, sir; it would not.

Int. 69. Look at "Tanner Patent-Office Model" and note the point of connection of the truck-levers with the centre lever, and state whether this brake, when applied to a car as indicated in the model it should be, would apply more or less power to the brake-bars on each truck than would the same brake when attached to the lever on one truck.

A. It would apply more power to two trucks.

Int. 70. Will you prove it by reference to "Defendants' Exhibit, large
Tanner brake?" (Witness connected one truck-lever with the
2025 first screw in the centre lever from the end, on each end of the
lever.) Will you please wind up the 16-inch wheel or larger wheel until the scale indicates 48 pounds in each truck and set down the dog in the ratchet? (Witness did as directed.) You will now take "Exhibit, round scale," and state how many pounds it takes to relieve the dog in the ratchet.

A. One pound.

Int. 71. You will now make a connection with the second screw, from the end of the lever upon either side of the centre of the lever, and state whether the connection as thus made is a correct representation of the connection as seen in the Patent-Office Model.

A. As near as I can approximate by measurement it is correct.

Int. 72. You will now wind up the larger windlass until you have exhausted all the rope, and state how many pounds are indicated on the scale in each truck.

A. Forty.

Int. 73. You will now take "Exhibit, round scale," and state how much it takes to relieve the dog in the ratchet.

A. Half a pound.

Int. 74. Would a brake applied as now seen in "Defendants' Exhibit, large Tanner brake," which you say is the same as applied in the Patent-Office Model, be a practical operative brake as applied to a railroad car?

A. It would not.

Int. 75. Will you give the reason why it would not?

A. It would apply too much power and require the use of too much chain. There would be too much play upon the levers.

Recross:

Cr.-int. 29. Have you ever noticed the fact in the Springfield brake that one chain would wind spirally on the windlass-staff, before last Saturday, when M'r Sayles pointed it out to you and M'r Adams on car No. 4?

A. I never did.

Cr.-int. 30. Do you recollect whether the chain caught on the eye?

A. It caught on the eye at this time. That was caused
2026 by the excess of chain falling in that direction, by the brake be-
ing on the opposite end. When he called my attention to this the brake on the opposite end was applied so it threw the excess of chain on the end we were examining, both rods coming in that direction indiscriminately, as the levers would go in that direction when the brakes were applied at the opposite end.

Cr.-int. 31. Did you examine the same car this morning; and, if so, will you state whether the brakes were loose, and whether you saw the man apply the brakes, and saw the chain catch on the eye at both ends of the car when it was applied, and twist the chain, and wind the chain spirally around the staff?

A. I did. The brakes were loose. I saw the man apply the brakes; and I saw the chain catch, but only as it ordinarily does in all brakes. The chain was wound slightly in a spiral manner around the shaft.

Cr. 32. Did you examine car U this morning and see the brake applied on it, and did you notice the same catching of the chain on the eye, and the same winding spirally of the chain on the brake-staff?

A. It might have been so, but I didn't happen to observe it.

Cr. 33. Suppose that the two chains of this Springfield brake should, from winding spirally, or other cause, draw unequally, would not the action upon the two trucks of the car be unequal?

A. That must be the result.

Redirect:

Int. 76. Would such assumed inequality injure the effective operation of the brake materially, in your judgment?

A. No.

Int. 77. Does it alter or change the effective operation of the old Springfield brake whether the chain connected with the long rod is connected with the windlass above or below the chain which runs to the lever nearest the windlass?

A. It does not. I should as soon set them one way as the other.

2027 Recross:

Cr.-int. 31. You say that the above assumed inequality would not injure the effect of the brake in your judgment; would not the question whether it injured the effect of the brake or not entirely depend upon how great the inequality was?

A. It would.

Redirect:

Int. 78. You seem to give preference to the Hodge brake compared with the Tanner brake and with the old Springfield brake. Is that so?

A. It is.

Int. 79. You will now please give your reasons, somewhat in detail, for such preference.

A. Because an application to a car is more easily made, and less skill is required to take care of it. And when it is not properly adjusted, it has an adjusting element at the command of the brakeman, by taking up the chain on the windlass at the opposite end from which he applies the brake. And because the power is always equally divided between both trucks when the car passes from a straight line on to a curve under the brake. What I mean by that is, that the Hodge brake, when applied upon a straight track, and it passes on to a curve, retains the same pressure upon both trucks, which is an element that no other brake possesses, except the Stevens brake.

Int. 80. Can you illustrate by "Defendants' Exhibit, large Tanner brake" (No. 123), the increase and decrease of power on each truck when the trucks are thrown out of line by passing from a straight line on to a curve under the brakes? If you say you can, please do so.

A. I can. I will first separate the piece representing the car-body from the trucks, by means of temporary supports. Secondly, I will wind up the windlass until the scales on the connecting-rods of each truck

indicate forty (40) pounds with the trucks in line. Thirdly, I will now place the trucks one inch and one quarter out of line, assuming a position they would hold in passing on to a curve. I now find the
2028 scale on the truck nearest the windlass, from which the power is applied, indicates forty-six pounds, while the one farthest from the same windlass indicates thirty-four pounds.

Int. 81. What change, if any, would take place in the power applied to each truck were the car to pass on to a curve the reverse of the one on which you have just placed the trucks of the car, as represented in said exhibit (123)?

A. The same difference would be shown upon the scales, except that the one that now shows the most would then show the least.

Int. 82. And would this power change from one truck to the other as the car passes from a right to a left-hand curve?

A. It would.

Int. 83. And would the power be restored to each truck as originally indicated in passing from the curve on to a straight track?

A. It would.

Int. 84. What have you to say in reference to the old "Springfield brake," touching the matter you have just illustrated, in reference to the old Tanner brake?

A. It is precisely the same.

Int. 85. How is the Hodge brake affected by these circumstances?

A. The pressure upon each truck is not changed, but always equal on a straight track and curve; that is, when passing from a straight track to a curve.

Int. 86. How would the Tanner brake be affected were the shoes of unequal thickness on the two trucks?

A. It would lose its equality or adjustment. The pressure on the two trucks would not be equal, the result tending to resolve it into a single brake.

Int. 87. How would the Hodge brake be affected were the shoes of unequal thickness on the two trucks?

A. The operation of the brake would not be affected.

Int. 88. Would the power be the same, or practically so, on each truck of the Hodge brake when the shoes are of unequal thickness? If you say it would, give your reason.

2029 (Objected to.)

A. It would. Because the power is always equally divided on the trucks, by means of swinging or sliding links in combination with the two equalizing levers between the trucks.

Int. 89. So far as holding the car under the brakes is concerned, is there or not any material difference between the Hodge brake, the old Springfield brake, and the Tanner brake, the levers in the windlasses and truck-levers in all the brakes being the same?

A. There is not.

Int. 90. Wherein, then, is the Hodge brake a more acceptable brake to railroad companies than either the Tanner or Springfield brakes?

A. It requires less skill to take care of it. It is not liable to lose its adjustment, and imparts the same power to each truck when upon a straight track or otherwise?

Recross:

Cr.-int. 32. Which do you consider the best brake, the Hodge or the Stevens?

A. The Hodge.

Cr.-int. 33. Why? Give your reasons.

A. I consider the Hodge brake more practical, because it does not lose its adjustment, compared with the Stevens.

Cr.-int. 34. Does a large number of the Vermont Central passenger-cars run over the Connecticut River Railroad, and have they the Hodge brake attached to them?

A. A few of them; but I am not positive what brake they have on them.

Cr.-int. 35. How long have they run over your road?

A. More or less during the last ten years or longer, to my knowledge.

Cr.-int. 36. Do the brakemen employed by the Connecticut River Railroad operate the brakes on these cars when running on their road?

A. They do.

Cr.-int. 37. You don't know, then, what brakes are used on the Vermont Central cars?

2030 A. I do not.

Cr.-int. 38. You see more or less of their cars daily around your shops?

A. I do, but have no care of them.

Cr.-int. 39. Is the Hodge brake attached to all of your passenger and baggage cars, except what have the Springfield brake on?

A. It is not.

Cr.-int. 40. What other brake?

A. The Stevens and Tanner brake, one of each.

Cr.-int. 41. Do the Hodge brakes on all of your cars all work equally well, so far as you know?

A. They do, on the same weight of car.

Redirect:

Int. 91. What defect is there in the Tanner brake that is not found in either the old Springfield brake, the Hodge brake, or the Stevens brake?

A. The Tanner brake loses its adjustment when the brake is applied upon a straight track, by means of a play about the centre-pin which passes through the lower frame-work of the car, and likewise through the balance-beam of the truck; and also to a play each side of the balance-beam and the centre-plates upon which the car rests on the truck, which allows the forward truck to fall back towards the centre-lever, giving less tension to the rod which connects the centre-lever to the truck-lever. It also allows the rear truck to fall back from the centre-lever, giving more tension to the rod which connects the truck-lever to the centre-lever. The result tends to resolve it into a single brake.

Int. 92. How is this defect increased or decreased by the wear about the balance-beams and centre-pins of the truck?

A. It is increased. When a car is new, it is in each truck from one-half an inch to an inch, when under the brake with the car in motion; and I have seen them, when worn, varying up to two inches.

Int. 93. Then the greater the wear or looseness of the balance-beam and centre-pins the greater this defect. Is that so?

2031 A. Yes.

Int. 94. Why is not the same defect observable in the old Springfield brake?

A. Because when the trucks fall back from the windlass more tension is put upon both rods that connect the truck-levers to said windlass, which affects the brake upon both trucks equally.

Int. 95. Does the same answer apply to both the Stevens and Hodge brakes?

A. It does.

Int. 96. Has your attention been called to the chains upon the windlass-staff of the old Springfield brake winding spirally on the shaft; if so, by whom; and what conclusion did you come to from the observation?

A. My attention has been called to it by M'r Sayles, the complainant. I concluded that it had a self-adjusting element, from the fact that if the chain was too long it would take a spiral form upon the shaft until its tautness was equal to its companion, and then would travel equally with it.

Int. 97. Have you read 141st direct interrogatory put to D. F. Adams, in this case, and the answer thereto; if so, do you concur with him in the statements therein made?

A. I have read them, and do concur with M'r Adams' statement fully.

Int. 98. How many cars are included in the experiment conducted by yourself and M'r Adams, for the purpose of determining the longitudinal motion of the bodies of cars upon the trucks, and what is the average number of inches of such longitudinal motion?

A. Thirteen cars were tried besides the one mentioned by M'r Adams as being excessively strained against the head-block. The average number of inches was 1⅛ inches.

Int. 99. In your judgment, is that a fair average of motion between body of car and trucks, as trucks are now constructed?

A. I so consider it.

Int. 100. What, in your judgment, would be a fair average of motion between body of car and trucks, as they were constructed ten or more years ago? Whatever your answer may be, give your reasons.

2032 A. One inch and one-half. This is on account of the narrowness of the swing-beam and size of the springs upon which it rested. At that time the balance-beam was 7½ inches wide generally on roads in New England, and especially upon the Connecticut River Railroad; and also the length of the suspending link, which allows the springs to turn over, with the beam forward and back, more readily than it does at the present day, with beams that range from 12 to 20 inches wide, and springs correspondingly spread. Improvements have been made, also, in the guides or friction-plates by making them larger; and also the transom timbers of the trucks are made larger, so that they do not spring as much under the pressure.

Int. 101. Have you read 140th interrogatory in this case, put to F. D. Adams, and the answer thereto? If so, are the satements therein made by him, according to your own knowledge and observation?

A. I have read said answer. I was present at the trials referred to, and consider M'r Adams' statement correct. I didn't measure the distance, but M'r Adams did; and I agree with him in the conditions as stated by him.

Int. 102. What instructions did you give to the brakeman before entering upon the duty assigned to him?

A. I told him to do justice in every trial, by applying the brake at the sound of the whistle as hard as possible—to use all the power he could exert each time.

Int. 103. Please give the diameter of the brake-wheel; also the shaft on which the chain is wound in operating the brakes; also the length of the long and short arms of the levers in the trucks; and also the length of the centre-lever, together with the kind of shoes, whether wrought or cast iron, on the car used for this experiment?

A. The diameter of the brake-wheel was 16-inch. The shaft is 1¾ inches in diameter. The long arms of the levers are 27 inches; the short arms, 6 inches. The centre-lever is 4 feet long, I think; but I can't be positive. The shoes were wrought iron.

Int. 104. How are the lever connections and brake-wheel connections made to the centre-lever?

2033 A. They are connected in line; that is, at the end of the centre-levers.

Int. 105. M'r F. D. Adams, in answer to 59th cross-interrogatory in this case, has alluded to a reverse curve, located between the track east of the depot in Springfield, but was not able to state the radius of said curve. Have you measured the verse sine of that curve on a chord of 40 feet and 7 inches? If so, with what result?

A. I have measured it; the verse sine is 2¾ inches.

Int. 106. Why did you take the measurement from a chord of 40 feet and 7 inches?

A. Because it was the distance from centre to centre of trucks of Boston and Albany passenger-car No. 142, being one of their longest cars, and of recent build.

Int. 107. In answer to the 19th direct interrogatory in this case, you say that the radius of a curve on the Connecticut River Railroad, located near the terminus of said road in this city, over which all passenger-trains have to pass, is 350 feet. What is the verse sine of a portion of that curve the chord of which is 35 feet, or the average length of the cars in the train on said road that has been run with the old Springfield brake applied?

A. Six inches. I did not arrive at this by figures, but by actual measurement upon the track.

Int. 108. What would be the deflection of the trucks of a car the wheels of which have a six-feet span—that is, from wheel centre to wheel-centre—from a line parallel to the body of the car, when run upon this curve?

A. Two inches.

Int. 109. How would this deflection of two inches affect the practical operation of any brake that might be applied upon passing over said curve under the brakes?

A. The effect would not be perceptible to the operator or to any one else; at least, such is my experience upon trial.

Int. 110. Please state what trial you have had, and when, to satisfy yourself upon this point?

A. I had trials upon this same curve in November last, by applying the brake upon a straight track, and passing on to the curve under the brake.

2034 Int. 111. What brake was used for the experiment?

A. The old Springfield brake; same as seen in "Model A, E. Merwin, U. S. C."

Recross.

Cr.-int. 42. What was the letter or number of the car with the Springfield brake on, like the model, and which you said you tried last November?

A. Letter "M."

Cr.-int. 43. Have you lately taken the Springfield brakes off from any of the cars on which you have recently had them, on the Connecticut River Railroad?

A. We have.

Cr.-int. 44. How many of them have you taken off?

A. Three.

Cr.-int. 45. Did you take them off in order to put on the Westinghouse air-brake?

A. Yes.

Cr.-int. 46. What form of double-acting brake have you put on these three cars in order to apply the Westinghouse brake?

A. Hodge brake.

Cr.-int. 47. In the Hodge brakes on the cars on the Connecticut River Railroad, have some of the windlass-staffs got worms at the lower ends?

A. Yes, sir.

Cr.-int. 48. And some of the windlass-staffs of said Hodge brakes, upon your road, are plain at the lower ends; that is, are without any worms, are they?

A. Yes, sir.

Cr.-int. 49. You have spoken of experiments made with a car having the Tanner brake, and then having one of its trucks disconnected, at which you said you were present. Was it the object of these experiments to see if you could stop the car as quickly with one truck disconnected, to make what you call a single brake, as you could with a double brake?

A. It was.

2035 Cr.-int. 50. Suppose a car brake to be proposed to you as a double-acting brake; and suppose that, in that brake, after the parts had been so adjusted that the brakes would operate properly while the car was on a straight track, the natural tendency was that, when the car with the brakes applied passed from a straight track on to a curved track it would cause the brakes of one truck to bind so hard as to slide the wheels of that truck, and would loosen the brakes of the other truck; would such a brake be a practical one for use on railroads?

A. I have had no experience with any such brake.

Cr.-int. 51. Would such a brake, in your judgment as a practical car-builder, be a practical brake?

A. I couldn't judge of it without seeing it. It might be modified.

Cr.-int. 52. Suppose it was not modified, but operated as in the hypothesis given you, would it be a practical brake?

A. To a certain extent it would be practical.

Cr.-int. 53. To what extent?

A. To the extent of a single brake, so called.

Cr.-int. 54. Which brake would be acting as a single brake—the one attached to the truck where the shoes were loose, or the one attached to the truck where the wheels were slid?

A. The one that absorbed the power from the windlass.

Cr-int. 55. Would not the one which absorbed the power from the windlass be the one where the wheels were slid, according to the supposition?

A. If any, it would.

ROBERT HITCHCOCK.

Deposition of W'm H. Stearns.

Int. 1. What is your name, age, residence, and occupation?

A. My name is W'm H. Stearns; my age, 50; residence, Springfield; occupation, master mechanic of Connecticut River Railroad Company.

Int. 2. Did you yesterday witness certain experiments with a 2036 double and single brake? If so, please state how those experiments were conducted, and what instructions you gave to the engineer who run the engine.

A. I did witness such experiments. We started, at a certain point, with an engine attached to a car. We shut off steam at a certain point and pulled the pin that connected the engine with the car, and the brakeman stopped the car as soon as he could, apparently. My instructions were to the engineer to keep the same pressure, use the same quantity of steam, and shut off at the same point, blowing the whistle when he shut off.

Int. 3. How many trials were made with the single and how many with the double brake? And what were the results, according to your observations?

A. We made two trials with each brake. The cars with the single brake stopped within a foot of where it did with the double brake.

Int. 4. What should you judge was the speed of the engine at the time the pin was pulled and the whistle blown for brakes?

A. I should judge from 25 to 30 miles an hour.

Int. 5. What were your means of judgment?

A. I was on the ground, and judged by the sound or quickness of the exhaust as much as anything.

Cross-examination by S. D. Cozzens:

Cr.-int. 1. Please state what was done with the double brake, to make what you have called the single-brake trials in these experiments.

A. We unhooked the rod running from the centre-lever to one of the truck-levers for the first single-brake trial, and then braked from the windlass, which was at the same end of the car as the truck-lever, which we disconnected. For the second single-brake trial we reconnected the truck-lever just spoken of, to the centre-lever, and then braked from the windlass opposite the one we used in the first trial.

Cr.-int. 2. Did you come to any conclusion after seeing these experiments? And if so, what was it?

A. I thought there was not as much difference between the double and single brakes as I had supposed there was.

2037 Cr.-int. 3. What was there about the experiment that led you to this conclusion?

A. The stops that were made; the points being so near together.

Cr.-int. 4. In any of these trials with the double-brake form or the single-brake form, was the brake so applied as to slide any of the wheels?

A. I didn't notice the first two trials about that. The second trial with the single brake, I think the wheels slid from 10 to 12 inches just as they stopped. Both pairs of wheels slid. On the fourth trial I didn't see them slide at all. I was watching for it, but did not see them slide.

W. H. STEARNS.

Deposition of James B. Clancy.

JAMES B. CLANCY, being called by the defendants, and duly sworn, testified as follows:

Int. 1. What is your name, age, residence, and occupation?

A. My name is James B. Clancy; age, 26; residence, Holyoke, Mass.; and my occupation, a locomotive engineer on the Connecticut River Railroad.

Int. 2. Were you detailed yesterday by M'r Stearns, master mechanic upon that railroad, to run an engine attached to a car, for the purpose of making certain experiments with brakes? If so, what instructions did you receive from M'r Stearns as to what you should do in the furtherance of said experiments?

A. I was so detailed. My instructions were to run to a certain point, to carry the same amount of steam, and to use the same power, to shut off at a designated point, and whistle down brakes at each trial.

Int. 3. What was the number of pounds of steam that your engine carried through the several trials?

A. I carried from 95 to 90 pounds of steam. I started each time with 95, and had 90 when I shut off.

2038 Int. 4. In your judgment, at what speed were you running at the time you shut off and called for the brakes?

A. About 25 miles an hour, I think.

JAMES B. CLANCY.

Deposition of William Carrigan.

WILLIAM CARRIGAN, being called by the defendants and duly sworn, testified as follows:

Int. 1. What is your name, age, residence and occupation?

A. My name is William Carrigan; my age, 31; my residence, Springfield, Mass.; and my occupation, a car-inspector on the Connecticut River Railroad.

Int. 2. Were you present yesterday at an experiment of double and single brakes on the Connecticut River Railroad; if so, how did it come about that you were present?

A. I was present; M'r Robert Hitchcock requested me to go there.

Int. 3. What did you do when you got there?

A. I acted as brakeman on the car.

Int. 4. Before acting as brakeman, what instruction did you receive?

A. To do justice each time I applied the brake.

Int. 5. What did you understand was the import of the instruction "to do justice each time you applied the brake?"

A. To put on my strength to the brake each time.

Int. 6. Did you apply your whole strength on the brake at each of the trials, without reference to whether you were applying the single or the double brake?

A. Yes, sir; I did.

Int. 7. Were you the brakeman who operated the brakes on the same car on a similar trial of double and single brakes made last November, and did you then exert your whole force to stop the car as soon as you could at each trial?

A. I was the brakeman. I did exert all my strength at each trial.

W. CARRIGAN.

2039 *Deposition of Henry A. Wright.*

Int. 1. Will you state your name, age, residence, and occupation?

A. Henry A. Wright; 31 years old; residence, Chicopee; am a farmer at the present time.

Int. 2. Have you been locomotive-engineer upon any road; and if so, upon what road, and when?

A. On the Connecticut River road.

Int. 3. From what time to what time?

A. From about 1864 to the 1st of March, 1872.

Int. 4. What train did you haul on the Connecticut River Railroad while you were engineer, the latter part of the time?

A. The last two or three years I hauled M'r Sampson's train.

Int. 5. Where does that train run from and to?

A. From Springfield to Northampton twice a day, to Holyoke once, and Chicopee Falls once.

Int. 6. In all, how many miles for a day's work?

A. I believe, about 96 miles.

Int. 7. About how many stops are made in that time?

A. There must be forty or fifty stops.

Int 8. Previous, say, to January, 1872, what brake was used on the cars composing that train?

A. When we first had these Wasson cars, it was, I think, what was called the Hodge brake.

Int. 9. Do you recollect thereafter a change being made in the brake on that train of cars already named?

A. I do.

Int. 10. Have you heard the name by which the brake goes?

A. I have been told it is the old Springfield brake.

Int. 11. Please state if you observed any difference in the stopping of the train at the stations after the change was made from the Hodge to the old Springfield brake?

A. When the brake was first put on I couldn't see any difference between the stops. After the brake was somewhat worn I thought it took a little longer to stop than when it was first put on.

2040 Int. 12. Are you in the habit of giving a signal for brakes?

A. Not unless it is necessary. If there is any danger ahead we give a signal. In making the common stops at stations we do not very often, unless the train is going to run by.

Int 13. Are all brakes, the Hodge included among them, liable to be out of order, and not perform one time as well as another?

A. I think they are.

Int. 14. In your judgment, is the Springfield brake a reliable brake when properly taken care of, and the wear of the brake taken up?

A. I think it is, when it is in order.

Cross-examined by M'r Cozzens:

Cr.-int. 1. You have never paid any attention to the subject of brakes, have you?

A. Not that I know of.

Cr.-int. 2. How many cars in M'r Sampson's train that you ran had the Springfield brake on?

A. Generally three cars; that is the usual number.

Cr.-int. 3. Three with the Springfield brake?

A. Three with the Springfield brake.

Cr.-int. 4. Were there any other cars in that train, at any time when the Springfield brake was used, which had the Hodge brake on?

A. Sometimes, not usually.

Cr.-int. 5. About how often do you think there were other cars in that train which had the Hodge brake on?

A. Perhaps not more than once a week. Any time when it was necessary to have more than those three cars, we were in the habit of having other cars, and some of them had the Hodge brake on, I believe.

Cr.-int. 6. You feel pretty sure, do you, that cars with the Hodge brake on did not run in that train more than once a week?

A. I hardly think they did.

Cr.-int. 7. You feel pretty sure of it, do you?

A. As a general thing, I am pretty sure of it.

2041 Redirect:

Int. 15. May not the fourth car that was sometimes put into the train in connection with the three have had the Springfield brake on?

A. I don't know as to that. As to the other cars, besides the three cars, I don't know what brake they did have on.

HENRY A. WRIGHT.

Deposition of William McCormick.

Int. 1. Please state your name, age, residence, and occupation.

A. My name is William McCormick; age, twenty-seven; residence, Springfield; I have been, until quite recently, brakeman on the Connecticut River Railroad.

Int. 2. What is your present occupation?

A. Baggage-master.

Int. 3. How long since you ceased to be brakeman?

A. Two weeks.

Int. 4. How long, prior to becoming baggage-master, two weeks since, have you been brakeman on the Connecticut River Railroad?

A. Five years.

Int. 5. On what trains have you run during that time?

A. For the last three years, nearly, I have run on M'r Sampson's.

Int. 6. Did you run with him up to the time you changed to the position of baggage-master?

A. No, sir; it is some three months since I left his train.

Int. 7. And on to what train did you go as brakeman?

A. The night express.

Int. 8. Where does the night express run?

A. To South Vernon.

Int. 9. Leaves here at what hour?

A. At 8.10.

2042 Int. 10. During the time that you ran as brakeman on said express train, did there come into your train the Tanner brake, as it is shown in "Defendants' Exhibit, large Tanner brake, 123," and, at other times, the old Springfield brake?

A. There did, sir.

Int. 11. It is presumed you had a pretty good opportunity to try the real value of the two brakes running in the rear of the train; what conclusion did you come to as to their comparative merits in taking the slack of the train, or in handling the train, when applying the brakes to bring it to rest?

A. I liked the Springfield brake best.

Int. 12. What reason have you for giving the preference to the Springfield brake?

A. I could check the speed of the train quicker, with less strength.

Int. 13. How with regard to its ease of operation, and the like of that?

A. I did not find any difficulty in operating the brake.

Int. 14. Prior to this time you now speak of, you ran as brakeman on M'r Sampson's train?

A. Yes, sir.

Int. 15. How many cars did you find in that on which the Springfield brake was applied?

A. Usually, three cars.

Int. 16. Ever four?

A. Yes, sir.

Int. 17. Usually, what brake was on the fourth car?

A. We had no particular car. Sometimes the Springfield brake would be on the fourth car; at other times the Hodge brake.

Int. 18. How many brakemen does this train which M'r Sampson runs carry?

A. Two.

Int. 19. And that whether there be three cars or four?

A. Yes, sir.

Int. 20. Is the train sometimes reduced to two, in any of these short trips?

A. It is, sir.

Int. 21. In that case is there more than one brakeman?

2043 A. Both men have to use a brake apiece.

Int. 22. It makes no difference, in running that train, whether it is the Hodge brake or the Springfield?

A. The Springfield brake is usually used.

Int. 23. Whether there were only two cars, or three or four, or more, as a general rule, you relied on no other brake than the Springfield to control the train?

A. No, sir.

Int. 24. About how many miles a day is the work of the train?

A. Ninety-six.

Int. 25. How many stops?

A. Forty-five or six.

Int. 26. Were you brakeman on the same train when they used the Hodge brake?

A. I was, sir.

Int. 27. Had you any particular place then to apply the brakes in approaching a station?

A. I did.

Int. 28. When you came to operate the same train with the Springfield brakes, did you have occasion to change the point at which you applied the brakes?

A. That depended on the speed of the train.

Int. 29. Did it also depend on the speed of the train when you had the Hodge brake on the cars?

A. I did, sir.

Int. 30. In either case?

A. Yes, sir.

Int. 31. What applies to the one applies to the other?

(Counsel for plaintiff objected.)

A. It does.

Cross-examined by M'r Cozzens:

Cr.-int. 1. You profess to compare the Springfield and Tanner brakes in reference to their holding the train; when you did so, how many cars had you in such train with the Tanner brake on them?

2044 A. Never but one.

Cr.-int. 2. How many other cars were there in that train in which the car with the Tanner brake ran?

A. Three others.

Cr.-int. 3. And did those three all have the Springfield brake on?

A. They did, sir.

Cr.-int. 4. Then, what you meant was, that three cars, with the old Springfield brake on, would hold the train better than one car, with the Tanner brake on, was it? or, if not that, what did you mean?

A. We take the slack of the train with the rear car, whatever car happens to be there, whichever brake happens to be there, and stop it with the others when we want to stop.

Cr.-int. 5. Do you mean, then, that when a car, with the Springfield brake on it, was in the rear of the train, you could take the slack of the train better than when a car, with the Tanner brake on it, was in the rear of the train?

A. I do, sir.

Cr.-int. 6. With which could you take the slack of the train best—the rear car with the Springfield brake, or the rear car with the Hodge brake?

A. The Springfield brake, when I used that, was better than the Hodge brake.

Cr.-int. 7. How many times did any cars, having the Hodge brake on, run in M'r Sampson's train, with any of those cars which had the Springfield brake on them?

A. I don't think more than once a week. I don't think it averaged more than that.

Cr.-int. 8. You were present and heard what the last witness said about once a week, didn't you?

A. I did, sir.

Cr.-int. 9. Do you feel pretty sure it did not average more than once a week?

A. I think it did not.

Cr.-int. 10. You feel positive of it, do you?

A. Might be more, and might not. I can't tell you exactly.

2045 Cr.-int. 11. Do you really know how often it was?

A. I do not, sir.

WILLIAM McCORMICK.

Deposition of Henry F. Sampson.

Int. 1. Will you state your name, age, residence, and occupation?

A. Henry F. Sampson; age, 37; residence, Springfield; occupation, conductor on the Connecticut River Railroad.

Int. 2. How long have you been conductor on the Connecticut River Railroad?

A. Fifteen years.

Int. 3. What train are you now running?

A. I am running what we term the local trains—short trains.

Int. 4. How long have you run that train?

A. I have always run them, for a regular thing.

Int. 5. How many cars compose it, as a general thing?

A. Three cars.

Int. 6. Do you ever have occasion to add to that number?

A. Very seldom.

Int. 7. How often?

A. Perhaps once a week—on Saturday. No other day, unless it is some holiday. I don't think it will average that.

Int. 8. Inasmuch as you have four cars with the Springfield brakes on them, may not the extra car be one with the Springfield brake as well as with the Hodge brake?

A. Yes, sir; it is liable to be that car as much as another.

Int. 9. May be that car as well as another?

A. Yes, sir. It is just as the cars happen to be in the yard.

Int. 10. And it may be the hind car, with the Tanner brake on it?

A. Yes, sir.

Int. 11. From this point to what points do you run this train, and how often?

2046 A. Twice a day to Northampton, 17 miles; once to Holyoke, 8 miles; and once to Chicopee Falls, 6 miles; and return, all of them.

Int. 12. At the time of the change of brakes on your train from the Hodge brake to the Springfield brake, were you made acquainted with the fact?

A. I was not.

Int. 13. How long did you run the train before you became aware of the fact of a change?

A. It might have been two or three days; I can't say as to the time exactly.

Int. 14. From the time that you did note the change, did you or not discover any difference in the stopping of the train at stations?

A. I did not discover any difference.

Int. 15. Please state whether you have discovered such difference since that time.

A. I have not.

Int. 16. Have you had any occasion to make any complaint to the engineer or brakeman for letting the train run by the stations since the change was made?

A. No, sir.

Int. 17. Ordinarily, then, I take it that you make the stops as well with one as with the other?

A. The train is handled just as well; I can't see any difference.

Int. 18. Have you, since the Springfield brake was put on to the cars of your train, had occasion to take the time required by the brakeman to bring it to a stop at the stations?

A. From forty to fifty seconds. I have timed it at different times with a wet rail and dry rail both.

Int. 19. What difference did you discover between a wet rail and dry rail in stopping the train?

A. Five and ten seconds. The engineer, of course, would give us occasionally sand, if it was a wet rail, and we were going by a station.

Int. 20. The sprinkling of sand from the sand-box on a wet rail will cause the wheels, as they go over it, to adhere as well as on a dry rail?

2047 A. Yes, sir; just as well.

Int. 21. Has there been any running by stations in consequence of the insufficiency of brakes?

A. No, sir.

Int. 22. Is your train still equipped with the Springfield brake?

A. It is; three cars.

Int. 23. Have you heard any complaint of the brakes not holding as well in running from a straight track to a curve, or from a curve to a straight track?

A. No, sir.

Int. 24. Has any complaint come from any quarter of the chains overlapping each other, thus shutting off the power from the wheels and rendering the brake inoperative?

A. No, sir.

Cross-examined by M'r Cozzens:

Cr.-int. 1. How many times since the Springfield brakes have been on your train have there been other cars in it having the Hodge brake on?

A. I don't think it has averaged once a week. Possibly on Saturday. Saturday is our heavy day, and we have an extra car on occasionally.

Cr.-int. 2. Would the occasions when, on Saturday, a car or cars with the Hodge brake on might be on that train be because you had to use more than three cars?

A. Yes, sir.

Cr.-int. 3. Did you see your train when it went out this morning?

A. I have not run to-day.

Cr.-int. 4. Did you see it when it came in this afternoon?

A. Yes; I saw the engine as I went down street a moment ago; that is all.

Cr.-int. 5. You didn't see the train?

A. No, sir.

Redirect:

Int. 25. Please state, if you know, what is the radius of the curve over which you have to run in coming into the station under the brakes at Springfield.

2048 A. I don't know. I have heard it stated, but I don't recollect.

Int. 26. Are the brakes applied to the cars of the train in passing that curve in coming in?

A. Yes, sir.

Int. 27. Have you ever discovered that the brakes either tightened or loosened in consequence of running on to that curve?

A. No, sir.

Int. 28. Do you or not consider that you are taking any extra responsibility in running a train the cars of which are equipped wih the Springfield brake instead of the Hodge brake?

A. No, sir. These same cars were fitted up five months with the Hodge brake, if you recollect, and then fitted up afterwards, about November, I think, with the Springfield brake. I could not see any difference in stopping the train. We ran from June to that time with the Hodge brake.

HENRY F. SAMPSON.

Deposition of Only L. Smith.

Int. 1. Please state your name, age, residence, and occupation.

A. My name is Only L. Smith; I am sixty years of age; residence, Providence, R. I.; occupation, car-builder on the Providence and Worcester Railroad.

Int. 2. Have you charge of the car department of that road?

A. I have.

Int. 3. And for how many years?

A. Twenty-five years, this month.

Int. 4. What brakes are in use on the passenger cars of your road at the present time?

A. The Hodge.

Int. 5. What brakes were in use on said cars before you adopted the Hodge brake?

2049 A. The Tanner; on the passenger cars.

Int. 6. Did you, some five or six months ago, restore the Tanner brake on one of the cars of your road; and, if so, for what purpose?

A. I restored the Tanner brake.

Int. 7. And for what purpose did you understand the restoration was required.

A. Well, I can't answer that; for I had no explanation of it, as I know of, at that time. I don't know what it was done for.

Int. 8. At the same time you restored the Tanner brake to a car on your road, what other brake did you apply to another car?

A. What is called the old Springfield brake.

Int. 9. Were the cars to which the old Springfield brake and Tanner brake were applied coupled together and run in the same train?

A. They were.

Int. 10. Please state what your instructions were in the application of the Tanner brake to a car, and of the old Springfield brake to another car, on the same road.

A. My instructions were to restore the Tanner precisely as it was run on the road when we used the Tanner. The other brake was applied according to a model shown by M'r Whipple.

Int. 11. Please state how you applied the brake as to the levers, and as to how you applied the chains to the levers which connect with the windlass staff.

A. The levers that were in the truck were not changed at all. I put two more in, and then crossed the rod, both top and bottom. These two added levers were placed at the ends of the trucks farthest from the windlasses. I connected one windlass with two chains, and the other with one chain.

Int. 12. What were the numbers of the cars to which the Tanner and Springfield brakes were applied?

A. No. 24 and No. 26.

Int. 13. Were those cars coupled together and put into the same train?

A. They were.

2050 Int. 14. How long were they run in that train?

A. No. 24 car was put on December 22; No. 26, December 28. No. 26 had the Tanner brake; No. 24, the Springfield. The Springfield brake was taken off the 22d of February, the Tanner the 24th.

Int. 15. What complaint, if any, came to you from the brakemen as to the working of the two brakes on their cars, respectively?

A. They complained that they could not hold their train with the new brakes I had just put on.

Int. 16. What disposal was finally made of the aforesaid brakes?

A. They were finally taken off by the order of the superintendent.

Int. 17. What, thereafter, was done with reference to either or both of those brakes?

A. The Tanner brake was put on a second time, March 20.

Int. 18. Under what circumstances?

A. By order of M'r Sayles.

Int. 19. How long did it continue on; and what disposal was made of the brake put on by order of M'r Sayles?

A. It was taken off the 4th of April.

Cross-examined by M'r Cozzens:

Cr-int. 1. How well did the Tanner brake work after it was put on in the way requested by M'r Sayles?

A. I have no means of knowing how it worked on the road,—not personally, from my own observation. I did not go on the train at all, or on the cars. I never tried the brake after it went out of the shop, with one exception.

Cr.-int. 2. What was the one exception?

A. That was when M'r Sayles and myself took a car with the Tanner brake, and one with the Hodge, to test the power of the two brakes in one position. That was on a curve.

Cr.-int. 3. How well did the Tanner brake work on that occasion ?

2051 A. Well, I will state that we took those cars out of the car-house; we had an engine come and take hold of them, and haul them out in front of the house on a curve. The first car had the Tanner brake on. The engineer pulled that car out until I ordered him to stop. I stepped up on to the foot-board and turned the brake with all the power that I had; stepped off the foot-board and gave a motion to the engineer to go ahead. He started the car about the length of it, the brake holding well. I got up on to the platform and let off this brake, hauled down the other car to the place, as near as we could, where this car with the Tanner brake started. I got up and screwed the Hodge windlass in the same manner, and gave orders for the engine to move; and it was my opinion that the Tanner brake, or the car that had the Tanner brake on, held better than the other. I formed that opinion from the motion and power applied to the engine to start it.

Cr.-int. 4. When you applied the Tanner brake the first time on the Providence and Worcester Railroad, as you have stated, who gave you instructions about how to apply it?

A. The instructions came from M'r Whipple, and were to put the Tanner brake on precisely as we used it. I had one of the centre levers in the blacksmith's shop, and I used one of the same levers that we had before, and I applied it just as near as I could.

Cr.-int. 5. Now please state in what way it was applied this first time?

A. Why, it was applied by a centre lever about four feet in length, with four rods at the ends.

Cr.-int. 6. Look at "Defendants' Exhibit, large Tanner brake, 123," now present, and say if it was like that, so far as the connections with with the centre lever are concerned?

A. Yes, sir; that is just the same.

Cr.-int. 7. Now, how was it applied the second time, as M'r Sayles requested you to apply it?

A. In each arm of the centre lever there was a hole drilled about nine inches from the end of the lever, and the link rods running to the respective truck levers were hooked into those holes.

2052 Cr.-int. 8. Was any change made in the proportions of the respective arms of the truck levers when the Tanner brake was applied this second time, as compared with what they were when applied the first time under M'r Whipple's directions?

A. There were no changes made in the truck levers.

Cr.-int. 9. In the case of the Springfield form of brake, where there are two chains winding around the same windlass staff, suppose that one of the chains, in being wound up, should catch around the eye of the windlass, and wind spirally round the windlass shaft, while the other chain on the same windlass wound straight, would the brake then brake alike on both trucks?

A. I should not think it would.

Cr.-int. 10. In your judgment, as a practical car builder, if a brake was liable to do that thing frequently, would it be an efficient brake for braking upon both ends of the car for passenger trains?

A. You are speaking now in regard to the old Springfield brake, as attached here; it would not be equal; it would be unequal.

Cr.-int. 11. That you have answered. The question is a step further than that?

A. I pretend to say that this chain will take up faster than that one. If it does, it don't wind up equal. If this chain laps under the eye, and t has the same diameter to wind on that this has, they will both wind up together; but if you are going to bring that eye there and this up further, an inch nearer the centre of your windlass, then one gains on the other.

Cr.-int. 12. If such a brake as this two chain Springfield brake would do that,—that is, act unequally on the two trucks,—would it be a reliable brake for acting on the two trucks?

A. It would not be reliable to act equally well; still, it would act. But one truck would get the advantage of the other,—have more power. You may stop your train. You might rely on it to stop at a station, but perhaps not as readily as you would if you had the power applied equally.

Cr.-int. 13. Until you know how much the inequality is, of course you can't tell?

2053 A. That is the matter.

Cr.-int. 14. Suppose this two chain Springfield brake had the length of the short rod and chain fourteen inches from the windlass shaft to the top of the truck lever, would, in your judgment, that be a safe brake to use for a passenger car?

A. Oh, yes. "Safe?" Yes, I think it would be safe.

Cr.-int. 15. Would you use it, if you could avoid it?

A. No, sir, I should not use it. I don't think I should long; because it wouldn't keep itself in repair, and I don't believe I should want to.

Redirect:

Int. 20. Was the experiment which you made with the Tanner brake and the Hodge brake, as you have already described, of such a character as led you to the conclusion that the Tanner brake was better than the Hodge brake for passenger cars? and, if not, why not?

A. No, sir; it don't wear the brake-shoes as equal. You can't adjust it as you can the Hodge brake.

Int. 21. Look at "Defendants' Exhibit, large Tanner brake, 123," and state, if the shoes are well worn on one truck and new shoes are on the other, whether there would be equality between the two trucks in applying power from the windlass to both trucks.

A. I say, equalize the shoes,—that don't mean unequal, that means equal,—and the power will be just the same.

Int. 22. But supposing they are unequal in thickness on the trucks?

A. They cannot be unequal; they have got nothing to make them unequal, unless one head is softer than the other; and then keep them equal by repairs; follow them up, keep them equal, and I cannot see why you cannot hold just as well with the Tanner brake as you can with the Hodge.

Int. 23. Assume that the car has come to shoeing in both trucks of the Tanner brake, and you leave the old shoes on one truck, and put new shoes on the other truck, and then put the car on the road, will the power be equal between the two trucks?

2054 A. Yes, sir; it will be equal, if they are properly adjusted, just as we would expect any man who does that business would have them.

Int. 24. Will they continue to be equal?

A. No; nor under any other circumstances. I don't care what truck, nor what brake you put on, you can't wear them equally. There are many reasons for it.

ONLY L. SMITH.

Deposition of V. D. Perry.

Int. 1. State your name, age, residence, and occupation.

A. V. D. Perry. Age 49. Residence Hartford. Occupation, master car-builder.

Int. 2. How long have you been?

A. I have been with the Hartford, Providence and Fishkill road 18 years.

Int. 3. How long have you been master car-builder on that road?

A. Seventeen years and a half.

Int. 4. Please state if you have at any time applied what is called the old Springfield brake to a car on that road? And if so, state how you placed the levers in the truck.

A. We applied a brake of that kind some time in February—perhaps the middle of February, 1872. We left the two brake-levers in the truck, and put in two more, and connected them on the windlass with the two chains at each end.

Int. 5. Did you put this car into a train?

A. We put it into one of our through trains, which we are running 122 miles a day.

Int. 6. What other brakes are in use on your road?

A. We have the Tanner and the Hodge brake.

Int. 7. To what extent are you using the Hodge brake?

A. We have got the Hodge brake on to 32 passenger-cars, and about 12 mail-cars. We are using the Tanner brake still on four or five short baggage-cars. We have not had time to change them.

2055 Int. 8. What brake did you use on passenger-cars previously to adopting the Hodge brake?

A. We used the Tanner brake.

Int. 9. How long is it since you adopted the Hodge brake?

A. I should think eight or ten months.

Int. 10. Then you are well acquainted with the operation of the Tanner brake

A. I am.

Int. 11. How did the old Springfield brake hold the car, as compared with the Tanner brake, on a car of like weight and construction?

A. As regards that, I never heard any complaint about the Springfield brake?

Int. 12. Have you been out on the road to see the operation of the Springfield brake on the car to which you applied it?

A. Never but once. I was obliged to go to Providence, and I went down on the train where this car was running, and watched the operation of it, because it was new to me, and I was very much pleased with the power of it. I did not notice but what it took up the slack of the train. From Hartford to Vernon, 15 miles, we run a car out behind this car; there, the other car is taken off, and this car is the rear car, from there to Providence, about 75 miles; and going down the mountain, we have to use the brakes a good deal. We have a steep grade for a number of miles, and it requires good brakes to hold the train in.

Int. 13. You depended upon this brake attached to the rear car?

A. We always do, to take the slack of the train, in the first place. That is rulable everywhere, I believe.

Int. 14. Who was brakeman on the train in which this car ran?

A. M'r Lewis has had more to do with the brake than anybody else. We changed the brake at Hartford. The man there runs 130 miles. M'r Lewis has run it 90 miles a day. That has been the regular run with him.

Int. 15. What size windlass wheel do you run on your passenger-cars with the Hodge or Tanner brake?

2056 A. We have used, for a great many years, a 16-inch wheel.

Int. 16. Do you make any difference in the size of the wheel, upon freight and passenger cars?

A. We have always used a 12-inch wheel on our freight cars, except that, on our coal cars, as we call them, we put a 10-inch wheel.

Int. 17. Why do you use a 12-inch wheel on a freight car, single brake, and a 16-inch wheel on a passenger-car, double brake?

A. In order to regulate the power. We spoil wheels enough, we think, with a 12-inch brake-wheel, without putting on a 16-inch.

Int. 18. Can a brakeman apply the same power to a double brake, through a 16-inch wheel, that he can on a single brake, through a 12-inch wheel?

A. I suppose he could, just about the same. That is one reason why we adopted two sizes of wheels.

Cross-examined by M'r Cozzens:

Cr.-int. 1. What are the lengths of the respective arms of the brake-levers, in the Springfield brake, as you have it on your road?

A. The long arms, 29 inches; the short arms, 7 inches.

Cr.-int. 2. What is the length of the short chains and rods from windlass-staff to top of brake-levers?

A. I should say the chain and rod would be about nine feet long.

Cr.-int. 3. Are the brake-levers to which these short chains and rods run, placed at the ends of the trucks farthest from the windlass?

A. They are.

Cr.-int. 4. What is the length of the long chains and rods, from windlass-shafts to top of brake-levers?

A. It must be 44 feet.

Cr.-int. 5. How long are the cars?

A. Our cars are about 43 feet, from outside to outside.

Cr.-int. 6. Take it from the outside to outside of platforms?

A. 49 feet; that is, to the brake-staff.

2057 Cr.-int. 7. In the Springfield brake, as you have it on your road, which chain and rod are uppermost—the short one, or the long one?

A. The long one.

Cr.-int. 8. How many cars are there usually run in this train in which you say this car with the Springfield brake on is?

A. Five or six. We run unequally. Some days we run more, and some less; but never less than five.

Cr.-int. 9. On the other cars, than the one having the Springfield brake, what brakes are used?

A. They have the Hodge brake.

Cr.-int. 10. How long had you used the Tanner brake on the Providence, Hartford and Fishkill Railroad, prior to your recent change to the Hodge brake?

A. Sixteen years, sir.

Cr.-int. 11. This grade, of which you speak, over the mountains, was the same during all the time you used the Tanner brake that it is now, was it?

A. The same; but our trains were not near so heavy.

Cr.-int. 12. Is it within your knowledge, that there was a suit brought by M'r Hodge, the patentee of the Hodge brake, against the Hartford, Providence and Fishkill road, for infringement of the Hodge patent, by using the Hodge brake?

A. Yes.

Cr.-int. 13. You were using the Hodge brake at that time?

A. We bought six cars with that brake upon them. They came there without any specification in regard to the brake; and, when we received them, they had the Hodge brake on. I suppose our superintendent did not know anything about the patent, and we run them for some months; but, as soon as we were sued by M'r Hodge for using his brake, I received orders from the superintendent to remove them, and did so.

Cr.-int. 14. What brake did you put on said six cars when you removed the Hodge brake?

A. Put on the Tanner brake.

2058 Cr.-int. 15. Did you have the Tanner brake on other cars besides these six cars?

A. We had the Tanner brake on the other cars.

Cr.-int. 16. And you continued to use the Tanner brake on all your passenger cars until you recently made the change, since the Hodge patent expired?

A. Yes, sir; we have talked a great deal about changing for the last six or seven years; but I never had any orders to change until since the Hodge patent expired.

Redirect:

Int. 19. Setting aside the Hodge brake, from what you know of the Tanner brake and the Springfield brake, if you were obliged to use one or the other, which would you choose?

A. I believe one is as good as the other, properly adjusted.

Int. 20. On what road in New England besides yours is the Tanner brake in use, within your acquaintance?

A. I don't know of any, at the present time.

Int. 21. And it is not in use on your road, except on a few cars?

A. I have left it on some little short cars—we call them 30-foot cars. They have not been run much. We have not had time to change the brakes on those cars. They are used only occasionally. I had orders to change everything, and intend to do so as soon as we can get time.

Int. 22. When this Springfield brake was put upon a car on your road, what did you understand to be the object in view in so doing? (Counsel for plaintiff objected.) Or, in other words, what did M'r Whipple state to you was the object?

A. To test its effectiveness and efficiency, as compared with the Tanner brake. That is what I understood to be the object.

Int. 23. Did you come to the conclusion that one was as effective as the other?

A. I did. There was no reason to think otherwise from our trial.

2059 Recross by M'r Cozzens:

Cr.-int. 17. Did you ever know the Springfield brake to be used regularly on any railroad in the United States, previous to the last year or so?

A. I never did.

Cr.-int. 18. Are you able to state what brake was used upon the New Haven, Hartford and Springfield Railroad down to the time of the introduction of the Hodge brake? If so, what brake was it?

A. I think it was the Tanner brake.

Redirect:

Int. 24. M'r Lewis has testified, in his cross-examination in this case, that the old Springfield brake, applied to a car of the Providence, Hartford and Fishkill Railroad, was taken off three or four weeks ago. Will you please state, first, what the object was of putting the brake on; and secondly, why was said brake taken off?

A. The object was to test the comparative merits of the old Springfield and Tanner brakes in the matter of holding the car. I looked after the brake thoroughly, during the time it was on that car. I satisfied myself, from close observation, and from statements from the brakeman, M'r Lewis, that it was as reliable as the Tanner brake, when in order. After using it four months, I ordered it off. It is a car we have always used regularly. It came in to repair a wheel, and we took the brake off and put the same Hodge brake on we took off.

Int. 25. Had there been no Hodge brake in use on your road, would you, or would you not, have taken off the Springfield brake for the purpose of putting on the Tanner brake?

(Objected to by M'r Sayles.)

A. No.

Int. 26. Your preference, then, as between the two brakes already named, I take it, is for the Hodge brake?

(Objected to.)

2060 A. It is.

Int. 27. What reason can you assign for your preference?

(Objected to.)

A. I should say, increased amount of leverage, giving more power, and also the self-adjusting qualities of the Hodge brake.

Cross-examined by complainant:

Cr.-int. 17. I think you stated, a few days ago, that the Tanner brake was applied to your cars same as "Defendants' Exhibit, large Tanner brake, 123."

A. I did.

Cr.-int. 18. If you had wished to increase your leverage or power, could you not have done so with the Tanner brake by attaching the rod running from the truck-lever to a point on the centre lever, between the outer end and the centre of said centre lever?

A. That would naturally increase the power; to what extent I can't say. I never tried it.

Cr.-int. 19. Do you build passenger cars for your road?

A. We do.

Cr.-int. 20. Will you please tell us how you construct the swing or centre beam of the trucks of your passenger cars and centre plates? How much play do they have lengthwise of the car?

A. We never give more than $\frac{1}{16}$ of an inch. We get cast plates about 6 inches square, and have them chilled and fastened to the centre-beams of the truck, also to the swing beam, and give a space of $\frac{1}{16}$ of an inch between the two. The centre plates are closely fitted, so that there is no play in them at all when they are new.

Cr.-int. 21. How much play will there be in them after they have run a year or so?

A. Not to exceed $\frac{1}{4}$ of an inch.

Cr.-int. 22. Do you think there was ever play enough in those parts of your passenger and baggage cars, to affect the practical working of any brakes you have used since you have been on that road?

2061 A. I do not.

Cr.-int. 23. Was the Springfield brake attached to the car spoken of by you on your road, as shown by Complainant's Accounting Exhibit, No. 2 (J. M. W. Y.)?

A. It was.

Adjourned.

Redirect:

Int. 28. Since your examination, has there a test been made on certain cars of the Hartford, Providence and Fishkill Railroad, to ascertain how much longitudinal motion there is between the body of the car and the truck? If so, upon what cars was the test made, by whom, and with what result?

A. There has been such a test made upon cars No's 5, 26, 17, 28, and 7, just as they were found in a train made up. They were passenger cars and a baggage-car, and all had the Hodge brake on. The test was made by making a centre mark on the body of the cars, and also on the truck-frame, and then barring the other truck ahead as far as it would go. This test was made by F. D. Adams, master car-builder of the Boston and Albany Railroad, Robert Hitchcock, master car-builder on the Connecticut River Railroad, and H. M. Perry, foreman in the car dep't of the H. P. and F. Railroad. Car No. 5 showed a longitudinal motion of ¾ of an inch; No. 26, ¾ of an inch; No. 17, ¾ of an inch; No. 28, 1 inch; No. 7, 1 inch.

Int. 29. What is the width of the bolster or swing-beam on the trucks, of the cars referred to in your last answer?

A. Twelve inches.

Int. 30. Prior to adopting the 12-inch bolster, what was the width of the bolster used?

A. Eight inches.

Int. 31. How long since did you use the 8-inch bolster, as a general thing?

A. We used it almost altogether up to three years ago; that is to say, up to the fall of 1869.

Int. 32. Which bolster gives the most longitudinal motion between the trucks and the car body?

2062 A. I should say the 8-inch, as it is more liable to tip when the chafer or friction-plates become worn.

Int. 33. What brake did you use on your passenger-cars when the 8-inch bolster was in use?

A. The Tanner brake.

Int. 34. When you used the Tanner brake, what did you frequently observe as to the sliding of wheels on the application of the brake?

A. I have noticed it was almost always the pair of wheels that was farthest from the brakeman that slid when the car was in the rear of the train.

Cross-examination by M'r S. D. Cozzens:

Cr.-int. 24. When you say the pair of wheels farthest from the brakeman, do you mean the pair of wheels at the farthest end of the car from the brakeman, or the pair of wheels at the farthest end of the truck next to the brakeman?

A. At the farthest end of the car from the brakeman, I mean, as stated.

Cr.-int. 25. About what is the average weight of the cars running in passenger-trains upon the Hart., Prov. and Fish. Railroad at the present time?

A. 16 tons.

Cr.-int. 26. For about how long have they been of this average weight?

A. Ever since the railroad has been in operation.

Cr.-int. 27. What is the weight of the heaviest cars on your road now running in passenger-trains?

A. 17 tons.

Cr.-int. 28. About what proportion of the whole number of cars running in passenger-trains upon your road are of this weight?

A. Just about one-half.

Cr.-int. 29. For about how long a time have you had that proportion of your cars of the weight of 17 tons?

A. About four years.

Cr.-int. 30. Previous to about four years ago, what proportion of your cars running in passenger-trains would weigh 17 tons?

2063 A. None of them.

Cr.-int. 31. Have you had no cars running in passenger-trains upon your road weighing 17 tons, except since four years ago?

A. I do not think we have.

Cr.-int. 32. About what is the average number of cars in passenger-trains upon your road at the present time?

A. Our trains will average four cars to the train; we run some heavier and some lighter trains.

Cr.-int. 33. What is the number of cars in your heaviest trains in your regular business?

A. Seven cars.

Cr.-int. 34. Between what points do these trains of seven cars run?

A. Hartford and Willimantic; at Willimantic we take off generally two cars, and run to Providence with five cars.

Cr.-int. 35. About how long have you run such trains as these; that is, seven cars to Willimantic and five to Providence?

A. For the last four years.

Cr.-int. 36. Now, excluding these trains just spoken of, what is the average number of cars to a passenger-train upon your road at the present time?

A. Four cars.

Cr.-int. 37. About how long has that been the average number on such trains?

A. Four years.

Cr.-int. 38. On the through passenger-trains at the present time, from Providence to Hartford, is the number of cars the same as from Hartford to Providence?

A. Yes; it is the same train with the same number of cars.

Cr.-int. 39. About how long has this been so?

A. Four years.

Cr.-int. 40. On page 221 of Defendants' Accounting Record you make this answer: "We spoil wheels enough, we think, with a 12-inch brake-wheel, without putting on a 16-inch." You meant, didn't you, spoiling them by the wearing due to sliding them?

2064 A. I did.

Cr.-int. 41. In your recall by the defendants, on the 15th of August, 1872, you stated that you "satisfied yourself, from close observation and statements of brakeman, M'r Lewis, that it (the Springfield brake) was as reliable as the Tanner brake, when in order." What portion of this conclusion was given by you from your own personal observation?

A. I made up my mind by observations in riding upon the car on various occasions. I went to Providence and back twice, and to New Britain several times.

Cr.-int. 42. At these times, how many other cars were there in the trains upon which you were?

A. At no time less than four.

Cr.-int. 43. Were Hodge brakes on all the cars of these trains except the one car which had on the Springfield brake?

A. They were.

Cr.-int. 44. How many brakemen were on these trains?

A. Two.

Cr.-int. 45. Were the Hodge brakes used on these trains when you were on them?

A. Of course they were.

V. D. PERRY.

The three following depositions were taken at Springfield, Mass., April 9 and 10, 1873:

Deposition of S. L. F. Deyo.

Direct examination:

Int. 1. What is your name, age, residence, and occupation?

A. Name, S. L. F. Deyo; age, 22 years; residence, New York City; occupation, civil engineer.

Int. 2. Have you in your possession drawings of the curves which lead
from Fourth avenue, New York City, into the yard of the old
2065 New York and New Haven depot, between 26th and 27th streets,
over which the cars of the New York and New Haven Company
run, prior to moving to the Grand Central Depot at 42d street?

A. I have.

Int. 3. By whom were said drawings executed and the date thereof?

A. Executed by J. Schuyler, and dated March 4, 1857.

Int. 4. Have you made tracings from these drawings? It so, please state the scale of said tracings.

A. I have. The scale is one inch equal to one foot.

Int. 5. You will now please look at "Defendants' Exhibit, 27th street curves," and state whether they are an exact copy of the original drawings by said Schuyler, except that they are enlarged?

A. They are.

Int. 6. Were said tracings made from said drawings by yourself?

A. They were.

Int. 7. Please state the radii of the curves so drawn and shown by said "Exhibit, 27th s't curves."

A. Fifty feet to the inner edge of the inside rails.

Cross-examination by S. D. Cozzens:

Cr.-int. 1. Did you see M'r Schuyler make the original from which this tracing has been made?

A. No; I did not.

Cr.-int. 2. You yourself don't know anything about the accuracy of the original drawing, do you?

A. No.

Cr.-int. 3. You made no measurements or surveys yourself before making this tracing, did you?

A. I did.

Cr.-int. 4. What did you measure or survey?

A. The curves as they now lie.

Cr.-int. 5. For what purpose did you measure them?

A. To get notes for a map.

Cr.-int. 6. Had this anything to do with this tracing?

A. I took the survey before the original drawing was found. After the drawing was found I made the tracing from it.

2066 Cr.-int. 7. Had you completed your surveys before the original drawing was found?

A. Yes.

Cr.-int. 8. How nearly do your surveys so made, correspond with the original drawing?

A. They correspond except in two respects: one is the distance between the tracks on the Avenue. In the original drawing that is six feet; by my survey it is five feet and three inches, so nearly as I can remember. The other is as to the radius. In the original drawing the radius is shown as being fifty feet to the inner edge of the inside rail of each track; by my survey I made it fifty feet to a line drawn equidistant between the rails of each track.

Cr.-int. 9. And I understand you that the tracing is in these respects like the original drawing, and not like your surveys?

A. Yes.

Cr.-int. 10. What do you mean by the rectangular lines marked "pier" in your tracing?

A. It refers to the "pier" that supports the iron gates of the yard at 27th st.

Cr.-int. 11. Also please state what the rectangular lines marked in length 25 f't refer to?

A. To 27th st. depot building.

Redirect examination:

Int. 8. What, from your own knowledge, is the radius of the several curves traced on said exhibit?

A. As the curves are now, they are fifty feet to a centre line between the rails of each track; and, what is said of one track may be said of all the curves intended to be represented by said exhibit.

S. L. F. DEYO.

Deposition of Henry Wolfe.

Int. 1. What is your name, age, residence and occupation?

A. Name is Henry Wolfe; age, 49 years; residence, New York
2067 City, and occupation, baggage-master for the New York, New Haven and Hartford Railroad at the Grand Central depot in New York.

Int. 2. How long have you been in the employ of said company, at what places, and in what capacities?

A. I have been in the employ of the New York and New Haven Company in the neighborhood of 19 years; at Canal st. and 27th st. in New York City; and 42d st. at Grand Central depot, in said city. At Canal st. I was assistant station baggage master; at 27th st. I was depot master, and for a short time before I left Canal st.; and now I am baggage-master at the Grand Central depot.

Int. 3. Have you knowledge of the curves in the track of the said New Haven Railroad leading from 4th Avenue into the yard at 27th st.

A. Yes.

Int. 4. Are the curves, as represented in "Exhibit 27th St. Curves," from your best recollection correct as seen in said exhibit?

A. Yes.

Int. 5. Were there other curves as sharp as those seen in said exhibit over which the cars of said New Haven road were hauled to Canal st.? If so, please state where they were located?

A. I think there was one on the corner Bowery and Broome sts. simi lar to it; another on the corner of Broome and Centre sts.; another corner Centre and Canal sts. On the return to 4th Avenue there was one on the corner Grand and Centre sts., and another on the corner of Grand and the Bowery. Making five curves in all.

Int. 6. Do the above named streets cross each other nearly or quite at right angles?

A. Yes, the same as seen on said exhibit at 27th st. and 4th avenue.

Int. 7. Did or not all the passenger cars including baggage and express of said New York and New Haven Railroad pass over these curves to Canal-st. depot?

A. Yes.

Int. 8. What other passenger cars besides those above named passed over said curves?

2068 A. New Haven, Hartford and Springfield cars and Boston and New York express line cars.

Int. 9. During what years did said cars, as above named, pass over said curve to Canal street, and return?

A. In 1855, 1856, and a part of 1857.

Int. 10. When did said cars begin to run into the yard at Twenty-seventh street over the curves represented in said Exhibit?

A. In July, 1857, and continued to run up to November, 1872, when they began to stop at the Grand Central depot at Forty-second street.

Cross-examination:

Cr.-int. 1. Did you ever measure any of the curves you have testified about to ascertain their radii?

A. No.

Cr.-int. 2. Then when you say that the curves at the Twenty-seventh street correspond with the Exhibit Twenty-seventh street curves, you are judging by your eye, are you not?

A. Yes.

Cr.-int. 3. And when you say that the other curves in New York City, of which you spoke, are, you think, as sharp as the Twenty-seventh street curves, you are also judging only by your eye, are you?

A. Yes.

Redirect examination:

Int. 11. From your personal inspection of the several curves of which you have testified, what is your judgment as to whether they are like or unlike as to the point of sharpness of curvature?

A. About the same thing, I should say.

HENRY WOLFE.

Deposition of John A. Hearn.

Int. 1. What is your name, age, residence, occupation, and by whom employed?

2069 A. My name is John A. Hearn; age, 30 years; residence, Springfield, Mass.; by occupation, mechanic, and employed by the Connecticut River Railroad Company.

Int. 2. Do you work in both wood and iron?

A. Yes.

Int. 3. Look at "Complainants' Accounting Exhibit, Hervey Waters' Radius Diagram, Sheet No. 2," and state whether you have made a model track of said diagram on the same scale and curve as the tracing therein shown?

A. Yes.

Int. 4. What is the scale and what the radii of the curves represented both in the diagram and model?

A. The scale is one inch to one foot, and the radii 800 f't.

Int. 5. Is there a reverse curve of the same radius shown in the model track?

A. There is.

Int. 6. How is said model track marked?

A. Marked in white paint, "800 f't radius."

Int. 7. Look at "Defendants' Exhibit, Twenty-seventh street curves," and state whether you have made a model track of said curves, and, if so, please state what is the scale on which it is made, and what are the radii, and how is said model track marked?

A. I have made such model track; the scale is one inch to one foot; the radii are 50 f't; the model track is marked "50 f't radius," in white paint.

Int. 8. Look at "Defendants' Exhibit, Springfield brake, No. 1," and state the scale on which said Exhibit is constructed in all its parts, including the brake attached thereto, and state what car on the Boston and Albany Railroad you took the measurements from; and also state whether the dimensions of the brake on said car are correctly represented in said Exhibit?

A. The scale is one inch to one foot. I took the measurements of all parts of the Exhibit except the brake from car "No. 136," and the brakes from car "No. 123." The bodies and trucks of the two cars are the same. The dimensions of the brake on said car "No. 123" are correctly represented in said Exhibit.

2070 Int. 9. Look at "Defendants' Exhibit, Springfield brake, No. 2," and state the scale on which said exhibit is constructed, and from what car you took the measurements.

A. The scale is one inch to one foot. I took the measurements from car "T" of the Connecticut River Railroad.

Int. 10. Look at "Defendants' Exhibit, Springfield brake, No. 3," and state the scale on which said exhibit is constructed, and the car from which you took the measurements of the body and trucks.

A. The scale is one inch to one foot. I took the measurements from car "No. 26" of the New York and Boston express line. The brake on said exhibit I put on according to drawings furnished me by M'r Robert Hitchcock, master car-builder of Connecticut River Railroad Company. The parts of the brake are intended to be on the same scale of one inch to a foot, as near as they conveniently could be.

Int. 11. Look at "Defendants' Exhibit, Hodge brake," and state from what car you took the dimensions, and the scale observed in the construction of said exhibit.

A. I took the measurements from the same car, "No. 26," above mentioned. The scale is one inch to one foot.

Int. 12. Look at "Defendant's Exhibit, Nichols-Tanner Brake," and state from what car you took the dimensions, and the scale used in constructing the exhibit.

A. I took the dimensions from car "N" of the Connecticut River Railroad. The scale is one inch to one foot.

Cross-examination:

Cr.-int. 1. Please measure and state what is the extreme length of said car "N," according to this exhibit, from the outsides of the platforms.

A. Forty-eight feet and three inches.

Cr.-int. 2. What is the extreme length between windlass-shafts of the car represented in "Defendants' Exhibit, Springfield Brake, No. 1"?

A. Fifty-eight feet and nine inches, as nearly as I can measure. It may be a little fraction over or under it.

2071 Cr.-int. 3. What is the extreme length between windlass-shafts of the car represented in "Defendants' Exhibit, Springfield Brake, No. 2"?

A. Fifty feet and five inches. It might be a little over or under.

Cr.-int. 4. What is the extreme length between windlass-shafts of the car represented in "Defendants' Exhibit, Springfield Brake, No. 3"?

A. Fifty feet and six inches.

Cr.-int. 5. What is the extreme length between windlass-shafts of the car represented in "Defendant's Exhibit, Nichols-Tanner Brake"?

A. Forty-eight feet and about three inches.

Cr.-int. 6. In making the model of the "Hervey Waters Radius Diagram, sheet No. 2," how have you obtained the radius and curves?

A. I took the tracing and put it upon the board I was going to make the curve upon, and pricked the lines of the curve, as shown by the tracing, through upon the board, and then tacked a track on to the board to correspond with the curves so pricked through.

Cr.-int. 7. Please state now how you obtained the curves in the model of the tracing "Defendants' Exhibit, 27th Street Curves."

A. I tacked the tracing down on to a large platform; then took as a point to start with the point marked "radius = 50′" on that one of the curves nearest the lines representing the depot buildings, and putting one leg of the compasses on that point, made a sweep with the other leg. I then placed one leg of the compasses on the point marked in red at the other end of the same curve, and made a sweep with the other leg. Then, at the point where the circles made by these two sweeps intersected, I placed one leg of the compasses, and stretched the other leg to correspond with the line of the same curve, as shown on the tracing, so as to see that the sweep that this leg of the compasses would make would correspond with said curve, and when I saw that it did correspond I took the tracing off the platform, and, with the compasses and the same points to work from, reproduced the same curves
on the model. I then took a channelling tool or plough-iron and
2072 made channels in the model to represent depressed tracks, cor-
responding in curvature with the curves obtained as stated, and added at each end of the curved parts stright lengths of track, long enough for one of these exhibit models to stand on.

JOHN A. HEARN.

Depositions of Jerry Perrin, Alfred Berney, Theophilus Chase, and Samuel B. Cushing, taken at Providence, Rhode Island, April 16, 1878, before Francis A. Daniels, U. S. commissioner.

Deposition of Jerry Perrin.

Direct examination:

Int. 1. What is your name, age, residence, and occupation; by whom are you employed, and how long have you been so employed?

A. My name is Jerry Perrin; am twenty-five years old; occupation, car-builder and repairer of all kinds of cars, especially the running-gear. I am employed in the repair-shop of the Providence and Worcester Railroad Company. I have been there eight years. I live in the city of Providence.

Int. 2. Look at "Defendants' Exhibit, Nichols-Tanner Brake," and state whether you have applied said brake to cars of the Providence and Worcester Railroad. If so, how long ago?

A. I have; eight years ago.

Int. 3. To what extent was the Tanner brake applied to the cars of the Providence and Worcester road eight years ago?

A. I believe we had it on five. I altered those five cars myself, and put on the Hodge brake.

Int. 4. Have you of late applied the same brake to car 27 of said railroad, and in the manner represented in said "Exhibit Nichols-Tanner Brake"?

A. I have, sir.

2073 Int. 5. What is the length of the centre lever between outside centres?

A. Four feet.

Int. 6. What is the length of the truck-levers?

A. Thirty-six inches.

Int. 7. And the length of the long arm of said levers?

A. Thirty inches.

Int. 8. Also the short arm?

A. Six inches.

Int. 9. These are the proportions, are they, of all the truck-levers on the passenger-cars, whether the Tanner brake or the Hodge brake?

A. Yes, sir. It don't make any difference what brake we use; they are all the same length.

Int. 10. Please look at "Defendants' Exhibit Lever Scales," and state whether you have applied said exhibit to the brake, as represented in said "Exhibit Nichols-Tanner Brake." If so, how did you apply the said lever scales?

A. I have, sir. I cut holes through the floor of the car, just back of the ends of the centre lever, and between it and the top of the truck-lever, and attached the lever scales to the rods running from both ends of the centre lever to the truck-levers.

Int. 11. Look at "Defendants' Exhibit Turn Buckle," and state where you applied it, reference being had to the aforesaid exhibit.

A. I applied it in each rod running from the centre lever to the truck-levers, at a point between the truck-lever and the lever scales.

Int. 12. After putting on the mechanism in this way, did you make any adjustment? If so, what, and how did you do it?

A. I turned the turn-buckle until each one of the balances of the lever scales showed, when the car was standing still on the straight track, the same number of pounds pressure.

Int. 13. Look at "Defendants' Exhibit, Springfield Brake, No. 2," and state whether, on the following day, you applied to the same car a brake like the brake represented in said exhibit; and, if so, whether you applied the same lever scales to said brake.

2074 A. I did, sir; except that the brake like this exhibit was only put on from one end of the car.

Int. 14. State where and how you applied the lever-scales to said brake.

A. I first took the centre-lever of the Tanner brake off, then connected the two jaws right together that were on the Tanner brake at one end of the centre-lever, which left one of the lever-scales in the same place they had been in, in the Tanner experiment; thus having them in the long rod represented in said exhibit. Then I jacked up the car, ran one truck out, turned it end for end on the track and ran it under the car again, so as to bring the truck-lever which had previously been at the outside end of the truck, at the inside end. I then cut a hole through the floor of the car between the body-bolster over that same truck and the first cross-piece of the car floor, and inserted the lever-scales into the short rod shown in said exhibit between the bolster and the next floor-joist of the car body.

Int. 15. After you had got the mechanism on as you have already described, did you make an adjustment? If so, how?

A. I did, by turning the turn-buckle until both scales indicated the same power upon both trucks.

Int. 16. What was the diameter of the brake-wheel used in both experiments?

A. Sixteen inches.

Int. 17. And what the diameter of the shaft on which the chains wound?

A. One and a half inches, the levers in the trucks being the same.

Int. 18. From which end was the brake operated in both cases?

A. The brake was operated in both experiments from the end of the car nearest the engine.

Int. 19. Look at "Defendants' Exhibit, Hodge brake," and state whether you applied said lever-scales to a brake on the same car, constructed like said exhibit. If so, at what places in the rods did you apply said lever-scales?

A. I did. I inserted one of the lever-scales in each of the rods running from the floating cross-lever to the truck-lever.

2075 Int. 20. When you had the lever-scales attached to the Hodge brake, did you find that they balanced, without requiring any adjustment to make them balance, on the application of the brake?

A. I did, sir.

Int. 21. Did you then let out the brakes of one truck one inch by turning the nut on the brake-beam back one inch, thereby making the brakes on that truck very loose, the brakes on the other truck remaining unchanged, and then apply the brake? If so, what variation, if any, was there between the power on the two trucks?

A. I did, sir. When I applied the brake there was no variation in the power on the two trucks, as shown by the lever-scales.

Cross-examination by M'r Cozzens:

Cr-int. 1. Are you certain that the Tanner brake, as used eight years ago on the Providence and Worcester cars as you have stated, was in all respects arranged on those cars as in the "Defendants' Exhibit, Nichols-Tanner brake?"

A. Yes, sir; except that there were no interchanging holes in the centre-lever as they are in the model. I think there were turn-buckles in the rods running from the centre-lever to the truck-levers, as in the model, but I cannot swear to that. The cars were forty-three feet long.

JERRY PERRIN.

Deposition of Alfred Berney.

Direct examination:

Int. 1. What is your name, age, residence, and occupation?

A. Alfred Berney; age, forty-three; residence, Jersey City, New Jersey. I am a manufacturer and inventor.

Int. 2. Have you witnessed certain experiments for the purpose of testing the power of different brakes of late?

A. I have.

2076 Int. 3. Please name the brakes in the order in which the experiments took place.

A. The so-called Tanner brake, the Springfield brake, and the Hodge.

Int. 4. How were the scales by which the power conveyed to each brake was measured, applied to the different brakes?

A. They were put up through the floor of the car, as indicated by "Defendants' Exhibit, Lever Scales." I should think those (pointing to exhibit) were the ones.

Int. 5. To which brake was the first test applied, and under what circumstances, and on what track or tracks? Please explain fully.

A. The Tanner brake, on the 28th of March, 1873. We started out with an engine and one passenger-car with no seats, empty. We went up the road, and before we got to what is called the Ledge Curve this side of Valley Falls on the Providence and Worcester road, the brakeman set up the brakes at twenty-eight pounds, and in going round the curve it varied some ten pounds, the end that I was on, which was the north end of the car. There was a little tremor to the scale, varying from one to two pounds with the motion of the car. In going back from Valley Falls the brake made the same exhibit as before. On the straight track it balanced. I looked at both the scales when they were set up by the brakeman, and noted that they both indicated twenty-eight pounds. I only looked at my end when they were going round the curve. I didn't make any notes of what took place on the Eaton Curve.

Int. 6. After these experiments, and the car had returned to the shop, what further test was said Tanner brake put to?

A. The car was shoved in on what is called a very sharp curve in the yard near the paint-house. The brakes were set up by the brakeman; the scale at the north end indicated six pounds, and the one at the south end thirty pounds. The locomotive pulled the car back and forth with the brakes set up. It made a variation on that brake at the end that I was on of from ten to fifteen pounds in going round the curve.

Int. 7. Please state the next experiment in order.

2077 A. The next experiment was the next day, with the same engine and same car, and with what I was informed was the Springfield brake. One of "Defendants' Exhibit, Lever Scales," was set up in a different part of the car from where it was the day before, set further apart, so as to adapt the scales to the Springfield brake. We went up to this side of the Ledge Curve, and the brakes were set at twenty-four pounds on a straight track. Upon the curve the variation was from twenty-four to sixteen pounds on the end that I was on, the north end; that is, it went from twenty-four down to sixteen. As the car went off the curve it went back to twenty-four again. The car was then hauled back to the paint-shop, and was put to the same test as when the so-called Tanner brake was on. It was braked up, and six pounds at the north end and thirty pounds at the south end was the pressure indicated by the scales. When the brakeman had pulled the brake to six pounds, at the end I was on, I told him to stop, because I wanted to see what power was on the other end; I went over and found thirty pounds pressure at the south end, that is, the pointer on the scales indicated thirty. It was then hauled up and down on the curve the same as the Tanner brake and indicated the same variations.

Int. 8. What other experiments did you thereafter witness, and what were the results?

A. On April 23d, the same car and the same engine, with what I was told was the Hodge brake, was tested. An engine was attached to the car and it was run over the track to the Ledge Curve, and there the brake was set at twenty pounds pressure on a straight track, and there was no variation in drawing it round the curve. There was a little tremor of the scale, the same as on the straight track, but no variation. It was then hauled back to the paint-shop and put on the curve. The man braked up the brakes to sixteen pounds at one scale and twenty at the other. That is, there was sixteen pounds on one brake and twenty on the other.

Int. 9. Did you note whether the connections with the lever-balance in the Hodge brake were the same as in the Springfield and Tanner brakes?

A. I noticed that in the Hodge brake, the truck rod connec-
2078 tions and the floating-lever connections, the lever-scales were placed in the middle hole, while those in the Tanner and Springfield brakes were in the upper hole of "Exhibit, Lever Scales."

Int. 10. Did you observe whether there was any sliding of wheels in these or subsequent experiments; if so, state what you observed?

A. Not in these experiments, but subsequently I did. At the end of each experiment which I have testified to, or about the time, but not when we were going round the curve, we braked up on the wheels to slide them. The Tanner brake was set at forty-two pounds on a straight track. The scales indicated that at each truck. The outside wheels of each truck slid at this pressure. The Springfield brake was set up, and to the best of my recollection it took the whole power shown on the scale, forty-eight pounds, to make the wheels slide. The Hodge brake was set up at thirty-eight pounds pressure, and, to the best of my recollection, all the wheels slid. It was gradually let off to twenty-four, when they rolled. At twenty-six it held the wheels still. The brake-shoes were so hot in all the experiments for sliding the wheels, the Tanner, Springfield, and Hodge brakes, you couldn't bear your hand on them. All these experiments for sliding the wheels were made on a straight track. In the experiments for sliding the wheels the brake shoes were all hot because the Tanner brake-shoes were hot, and I said the other shoes must be hot so as to give them a fair test.

Cross-examined by M'r Cozzens:

Cr.-int. 1. When the wheels slid in the sliding of the wheels' experiment, were you where?

A. I was in the car. Sometimes I was in the car; sometimes I was standing on the track.

Cr.-int. 2. Where were you when the sliding took place, as you have just detailed it in the various experiments?

A. During some of the experiments I was in the car, and during some I was on the track.

Cr.-int. 3. During those times when you were in the car how could you tell whether the wheels were sliding or not?

2079 A. I would be at the scales. The brakeman would say they were sliding. I would note the pressure and immediately run out and see if they slid, myself.

Cr.-int. 4. Where did you run out to?

A. I went out on to the platform and leaned over the step.

Cr.-int. 5. Did you do this in all cases before the car stopped?

A. Yes, sir; in all cases, just as quick as I got the signal from the brakeman that they were sliding. Or, if I was on or near the track and saw them sliding, I would run and get on as quick as I could and look at the indicator.

Cr.-int. 6. Was the brakeman turning the wheel at the time he called out to you that the wheels were sliding?

A. He would brake up a little and then look over the side to see if the wheels slid.

Cr.-int. 7. Then after the brakeman called out to you that the wheels were sliding, the car was dragged some distance in all the experiments, was it not, with the wheels sliding?

A. Yes, sir.

Cr.-int. 8. If the car was dragged with the wheels sliding, it would very soon heat the brake-shoes, wouldn't it?

A. I don't appear here as an expert.

Cr.-int. 9. Cr.-int. 8 repeated.

A. I think it would not, sir; if it held the wheel perfectly still.

Cr.-int. 10. The brake-shoes wouldn't get hot when they were not touching the wheels, would they?

A. No, sir. It is in the act of the wheels when they run rapidly and the shoes trying to stop them. But after the wheel was stopped, being no friction, there would be no heat except the heat that had been already developed.

Cr.-int. 11. At the time these wheels were slid as you have stated, how fast was the car running?

A. I told the engineer to go about the passenger rate, twenty to twenty-five miles an hour.

Cr.-int. 12. You have stated that in the Tanner brake experiment at
the Ledge Curve, the brakeman set the brake at twenty-eight
2080 pounds, and in going round the curve it varied ten pounds at the
end you were at, nearest the engine. In which direction, with reference to the motion of the car, did the curve turn—to the right or to the left?

A. It turned round to the left.

Cr.-int. 13. Was this variation of ten pounds from the twenty-eight pounds down?

A. Yes, sir; down to eighteen.

Cr.-int. 14. Was there any variation from the twenty-eight pounds up?

A. No, sir.

Cr.-int. 15. Didn't go beyond twenty-eight pounds?

A. No, sir; steadily went down. When it got to the lowest notch, I noted that as eighteen pounds.

Cr.-int. 16. Did the index go steadily down from twenty-eight pounds down to eighteen, without tending back towards twenty-eight at all?

A. There would be a little tremble but no going back. It would keep steadily going down. Then as we went round the curve on to the straight track, it would go back again.

Cr.-int. 17. While this was taking place at the truck where you were, do you know what was taking place at the other truck?

A. Not of my own knowledge.

Cr.-int. 18. Do you know the radii of any of these curves?

A. No, sir.

Cr.-int. 19. In regard to the Springfield brake experiment did the variation which you have spoken of from twenty-four pounds down to sixteen, continue steadily down from the twenty-four to the sixteen?

A. It did, just the same.

Cr.-int. 20. Was there any variation above the twenty-four?

A. No, sir; if there had been I should have noted it.

Cr.-int. 21. And it tended steadily down without going back to the twenty-four until you got off the curve?

A. Yes, sir; as it went off the curve it let up.

ALFRED BERNEY.

2081 *Deposition of Theophilus Chase.*

Direct examination:

Int. 1. What is your name, age, residence, and occupation?

A. My name is Theophilus Chase; age, twenty-eight; residence, city of Providence. I am a carpenter; work principally on railroad cars in the repair-shop of the Providence and Worcester Railroad.

Int. 2. Have you ever acted as brakeman on the Providence and Worcester Railroad; if so, when, and how long?

A. Yes, sir; off and on all the time for the last two years. I have had charge of the yard there, braking cars, both passenger and freight, and working in the shop. All the braking that is needed I have to see to myself.

Int. 3. While certain experiments were carried on a few days since, on a car of the Providence and Worcester Railroad for the purpose of testing the power of different brakes on each truck, did you set up the brake until you exhausted the power on the lever-scales when said scales were applied to the Tanner or centre-lever brake?

A. I did.

Int. 4. You brought both scales up to forty-eight pounds?

A. Yes, sir.

Int. 5. Did you also, when the brake was applied to a car with the Springfield brake on, set up the brake until the scales indicated forty-eight pounds on both trucks?

A. Yes, sir.

Int. 6. Were there one or two chains winding around the brake-shaft?

A. On the Springfield brake there were two chains, on the Tanner there was one.

Int. 7. Did you also set up the brake on the car when the Hodge brake was applied, and note the power on the scales?

A. I set it up as far as the scales would go on both ends, so that the scales indicated forty-eight pounds.

2082 Cross-examination by M'r Cozzens:

Cr.-int. 1. Has your experience as brakeman enabled you to know, when you look at the brake, whether the adjustment of the shoes to the wheels is properly made?

A. On some parts of them I do, and some parts I don't pretend to have anything to do with or say anything about.

Cr.-int. 2. Do you know when a brake is in a proper state of adjustment?

A. I do.

Cr.-int. 3. Do you know when a brake is so adjusted that the shoes will all come up against the wheels simultaneously with as nearly equal power as the leverage given to the brake will permit?

A. Yes, sir.

Cr.-int. 4. How perfectly was the Springfield brake, as it was called, in these experiments adjusted at the time the experiments commenced?

A. I can't say anything about that.

Cr.-int. 5. Did you pay any attention to it to see?

A. No, sir; I only attended to the braking.

Cr.-int. 6. Did you, with each of the three brakes—the Tanner, the Springfield, and the Hodge—apply the brake with about the same force, as near as you could tell?

A. Yes; about the same force. There were some variations. One would set up a trifle harder than the other.

Cr.-int. 7. There wasn't much difference, was there?

A. There was some difference; not to amount to anything.

THEOPHILUS CHASE.

Samuel B. Cushing, of the city and county of Providence, in the State of Rhode Island, being duly sworn according to law, testifies and says as follows:

Deposition of Samuel B. Cushing.

Direct-examination:

Int. 1. What is your name, age, residence, and occupation?

2083 A. Samuel B. Cushing; reside in the city of Providence; am a civil engineer by profession; am sixty-two years old. I am employed by the Providence and Worcester Railroad as a civil engineer, and have been ever since the road was surveyed. I began the survey of the road, I think, in 1844; finished the preliminary survey that year, and the construction was commenced the next season. The road was finished in 1846, I think.

Int. 2. Do you know of a curve in the main line of the Providence and Worcester road, near Valley Falls, called the ledge curve?

A. Yes, sir; between Valley Falls and Central Falls.

Int. 3. According to your survey, what is the radius of said curve?

A. Fourteen hundred and thirty-two (1,432) feet, or a four degrees' curve.

Cross-examination by M'r Cozzens:

Cr.-int. 1. Going from Providence to Worcester, in which direction does that curve turn, to the right or to the left?

A. From Providence to Worcester, it curves to the left.

SAMUEL B. CUSHING.

Examination taken, reduced to writing, and by the witness subscribed and sworn to, before me this sixteenth day of April, A. D. 1873.

FRANCIS A. DANIELS,
U. S. Commissioner.

Deposition of Henry Waterman.

Reported by J. M. W. Yerrinton, at Boston, April 18 and 19, 1873.

Direct examination:

Int. 1. What is your name, age, residence, and occupation?

A. Henry Waterman; 55; Hudson, New York; mechanical engineer.

2084 Int. 2. Have you been examined on the part of the complainant in this case? If so, about what year?

A. I did not expect to be asked about that. I thought you were going to ask about the Springfield brake. I have been examined by the complainant in this case; I think it was in 1868.

Int. 3. How long have you been a mechanical engineer?

A. I was put into a machine shop in the year 1831, and have been from that time to this an engineer.

Int. 4. Please state whether you are familiar with all kinds of machinery, especially railroad machinery, and at how early a day did you become acquainted with railroad machinery, and what have been your advantages for obtaining a knowledge of it, and what inventions have you made in railroad machinery that have gone into use? Please explain on all the points inquired of, in detail.

A. In the year 1837, I was employed to take charge of the machinery of the Hudson and Berkshire railroad, and continued, directly or indirectly, connected with that road something like seven years. Then there was an interval of a few years that I was engaged at fire-engines; and in 1847 I commenced building locomotive-engines for the Hudson River Railroad, and continued my connection with the Hudson River Railroad until 1854. Since that time I have withdrawn from direct connection with railroads, and have been making experiments at novel contrivances, etc., connected with railroad machinery, and am so engaged to-day. In 1840, I constructed the first eight-wheel locomotive, I think, that ever ran successfully; that is, the connection of four driving-wheels with four truck-wheels. The model was adopted for engines built for the Western Railroad. Major Whistler examined it, and constructed some after it. I made the first swinging-bolster passenger-car in 1839, and ran three such cars on the Hudson and Berkshire railway. I was the inventor of the cast-iron saddle for locomotive cylinders on these locomotive-engines. I think I used the first India-rubber springs ever used on a railroad, as early as 1839. I invented and constructed the first dummy-engine ever
built for hauling cars in the streets of cities. I invented what is
2085 called the pop safety-valve, for relieving locomotive boilers, which
I did in 1853, of which about six thousand have been sold and gone into use. I have invented, and am now running, a novel slide-valve upon a locomotive-engine, by which I guarantee to the railroad (the Albany and Susquehanna Railroad or Delaware and Hudson Canal Co.) a gain of 20 per cent. in power over the best locomotive of its class. I was informed last week of its perfect success.

Int. 5. Have you of late witnessed the operation of the Springfield brake on a train of cars running between Boston and Albany? If so, when did you witness such operation, and state in detail what you noticed in reference to the operation of the same.

A. Yesterday I witnessed the operation of a train the cars of which, with one exception, were fitted with the Springfield brakes. There were four cars with the Springfield brake and one with the Hodge brake on the train. I saw the brake for the first time yesterday morning, at five o'clock, prepared to go out upon the Boston and Albany road. I was requested to see if the rear car, specially fitted with the Springfield brake, had power to hold what is called the slack of the train, and to note generally the power and action of the brake at the stations, and also running down the inclined planes or grades. I at once noticed a defect in a car that appeared to have just come out of the shop. There was a nut upon the shaft of the windlass that interfered with the natural action of one of the chains, and the first time it was wound up, I think at one of the first stations—the Ashland station, I think—the upper chain caught on the nut, and the car did not show its full power in stopping, and the train ran by the station. The car failed to draw upon the train and hold back what it should. After that it caught a few times, but generally ran free, in the normal condition, upon the barrel; and when it did run upon the barrel properly, free from this nut, I had a good opportunity to watch its actions and note carefully the result.

Int. 6. Now go on from station to station, and make such remarks as you think proper.

2086 A. With regard to holding the train at stations, I think Ashland station was the first one we ran by. I am quite sure it was. It ran by, I should judge, pretty near two-thirds the length of the train. We ran by another station; the name I don't recollect, only it was on one of the grades descending towards Springfield. Otherwise the stops were very good, fair stops. On running upon the inclined planes, the brake was applied.

Int. 7. Please state where these inclined planes were on the line of the road.

A. The first trial of that kind was made upon the inclined plane running down into Springfield from the east. The next great trial was running from the summit—I think the grade commences at Dalton station—down to Pittsfield; then, again, running down from Schodack to Albany.

Int. 8. State what you observed on these different grades as to the holding power of the brake.

A. On all of these grades the brake on the rear was used to hold the slack of the train, and to hold the train. On the grades that are said to be fifty or sixty feet to the mile—that is, the grade going down into Springfield, and the grade from Schodack to Albany—the brake on the rear car (being the Springfield brake) held four cars in the train. On the grade, said to be about eighty feet to the mile, from Dalton to Pittsfield, the brake held three cars. Some of these grades had curves. The Springfield grade is on a straight line; the grade down from Dalton is mixed, straight lines and curves; and also the grade from Schodack to Albany. The latter grade is generally tolerably straight. In regard to holding, I observed that the application of the windlass-wheel and the part of the shaft where the chain winds on the Springfield brake, was not sufficient to develop the power of the brake fairly, owing to the want of size of the wheel; that, in comparing it with the Hodge brake, using the same size windlass and shaft, the same force upon the wheel applied but one-half the force to the brake-blocks on the wheel, and that the brakemen had to use their hands harder and with more force to produce the requisite power.

Int. 9. Did you notice whether the Hodge brake had the same shaft and wheel that the other brakes had on which to wind the chain?

2087 A. It had the same. I can say, generally, that upon examining the brake and its action, yesterday, it was a brake that in practice would compare favorably with any of the brakes used before the invention of the Hodge brake.

Int. 10. You speak of the windlass-shaft on the rear car of the train, which had the Springfield brake on, having a nut on that obstructed the normal winding of the chain round the barrel. What effect did such nut have upon the application of power to the wheels? And was such defect due to the brake or the imperfection of the mechanism?

A. The effect was to wind up one chain much more rapidly than the other; indeed, so as to leave the other chain quite slack; to apply the brake only to one truck; and, by practically enlarging the barrel upon which the chain wound—by increasing its diameter—to destroy the force about one-half, I should think, of that single brake.

Int. 11. Were there nuts upon the shaft upon which the chain winds on the Springfield brake, on the other cars in the train?

A. I did not observe one on any other car in the train. This was the front end of the rear car. It was just the worst place they could possibly put it.

Int. 12. Was it proper that such a nut, for such a brake, should be upon the barrel on which the chain winds?

A. It ought to have been put through and riveted down smooth, like the other. It was a very improper place for a nut, and acted very badly in this trial. It ought to have been riveted down, and made a flush cylinder to wind the chain upon.

Int. 13. Was this nut merely incidental, or was it part of the brake?

A. I consider it a great oversight in the parties who put it on, and not necessarily a part of the brake.

Int. 14. Was it in consequence of this nut being improperly applied that the power was shut off from the wheels in a manner to prevent the brake from doing its proper duty?

A. I think the brake lost one-half of its power by the action of the
chain over that nut. After working the brake a few times, it did
2088 finally pass round the shaft without being obstructed by the nut.
It improved by practice, and at last ran very well. It caught
once or twice, but not so seriously after that, and generally it ran very well after that. I will here state that in the experiments when running down the grades west of Springfield, the brakeman, M'r Gardner, was placed upon the rear platform of the car, and did the braking from that position, in order to work the brake in a fair way, and I found the action very much improved. I will here state that on the high grades running down from Dalton, the speed of the train being under the control of M'r brakeman Taylor, of the western division, he placed himself so as to signal to M'r Gardner through the car, and did signal to him to take off the brake, as the train was going too slow.

Int. 15. Was the train, at this time, being entirely controlled on the grade by the action of the Springfield brake on the rear car, operated from the rear end?

A. It was. (M'r Cozzens. How do you know it was?) I will answer that. I charged the other brakemen not to use the brakes. I passed continually through the train to see how the brakes were holding, and to see that there was no other brake applied on the train.

Int. 16. Was there any nut on the barrel on which the chain winds to obstruct the winding of the chain at the rear end of the rear car?

A. No; I did not observe that. The train was running so satisfactorily that it did not occur to me to examine it.

Int. 17. Then, if I understand you, there were but two occasions, during the whole trip from Boston to Albany, in which the train ran past stations?

A. There were but two where the running by was observable, I mean to say.

Int. 18. Was this a way-train, making all the stops?

A. I believe they made all the stops. They made a great many stops. Not being familiar with their usual time schedule, I cannot answer as to the stops.

Int. 19. Who was the brakeman on the rear car?

A. M'r Gardner.

Int. 20. George Gardner, the gentleman present?

2089 A. George Gardner, the gentleman present, I will say.

Int. 21. Who was the brakeman on the other part of the train?

A. M'r O'Brien had charge of the brakes in front of the train.

Int. 22. The William O'Brien present?

A. Yes.

Int. 23. What other persons were connected with the train in this operation of the Springfield brake, as you have stated yesterday, from Boston to Albany?

A. There were two regular brakemen belonging to the train with us, both east and west of Springfield. I know the name of but one of them—M'r Taylor, of the western end.

Int. 24. Was M'r Sayles, the complainant in this case, present, to observe the operation of said brake from Boston to Albany?

A. M'r Sayles was present all day.

Int. 25. I think you have stated that there was one Hodge brake upon one of the cars of the train. Was that brake used to stop the train at any point between Boston and Springfield?

A. I do not know of its being used. I charged the brakemen not to use it, and saw no evidence that it was used. It was not used in my presence.

Int. 26. The whole reliance to stop the train was upon the four cars having the Springfield brake, if I understand you?

A. That was so.

Int. 27. Was there occasion to use the Hodge brake from Springfield to Albany? and, if so, when and by whom?

A. It was used in making the stops at all the stations on the high grades, and, indeed, all the stops, as far as I know.

Int. 28. Was it used in taking the train down the grades on the eastern slope of the Green Mountains; or was reliance placed entirely on the rear car, with the Springfield brake, as you have already stated?

A. No brake but the Springfield brake on the rear car was used, within my knowledge, on any of these grades, except at stations.

2090 Int. 29. Why did you allow it to be used at stations?

A. It is quite necessary, to make good stops at stations, to use all the brakes on all the cars in the train, and consequently we were compelled to use that.

Int. 30. What do you think would have been the result had you depended upon the Springfield brakes from Springfield to Albany, as you did from Boston to Springfield?

A. I question whether we could have made as good stops at the stations going down without the use of that brake, for the reason that that car would be exerting all its momentum and no brake on it. It is making the brakes on four cars do the work of stopping five cars.

Int. 31. But you did make the brakes on four cars do the work of stopping five from Boston to Springfield?

A. We did; the grades were not so high.

Int. 32. But you thought it prudent to use all the brakes on the train on the grades between Springfield and Albany?

A. That is so.

Int. 33. Had the car with the Hodge brake been taken out, do you think you would have had any difficulty in taking the four cars with the Springfield brakes on from Springfield to Albany, and stopping at the stations as a train ought to be stopped?

A. I think there would have been no difficulty.

Int. 34. Do you know of any matter or thing of benefit to either party in this suit that you have not testified to? If so, you will please state it here.

A. Nothing occurs to me now.

Cross-examined by M'r Cozzens:

Cr.-int. 1. Have you for some years past been engaged, either by yourself or in connection with other persons, in introducing and in selling to railroad companies the safety-valve for locomotives to which you referred in your direct testimony?

A. I have, sir.

Cr.-int. 2. Have you received from these sales, as your share of the proceeds, a considerable sum of money?

A. I have, but I think I have given them an equivalent.

2091 Cr.-int. 3. Are you at the present time engaged in introducing and making sales of the same valve to different railroad companies?

A. I am so engaged.

Cr.-int. 4. Please mention some of the railroad companies which have purchased of you, or as the result of efforts in which you have taken part, the right to use these valves.

A. I think we have sold some of the valves to nearly two hundred roads.

Cr.-int. 5. In what part of the country? What proportion in New England?

A. Most of the New England roads use them.

Cr.-int. 6. Is the Boston and Albany Railroad one of the roads to which you have sold the right?

A. On the section of the road between Boston and Worcester they are using these valves; on the section west of Pittsfield, between Pittsfield and Albany, they are using them.

Cr.-int. 7. Do you consider it an important matter to you personally that the sales of the right to use these safety-valves, or the valves themselves, to railroads, should be as large as possible?

A. I think it is more important to the railroads themselves than it is to us. We have entirely prevented the explosion of steam-boilers. (Question repeated.) It is of considerable importance to me to sell as large a number of these safety-valves as possible.

Cr.-int. 8. Are you the inventor and patentee of one of the patents on this valve, which is used in its manufacture?

A. I am; and the original one.

Cr.-int. 9. About how long have you been engaged in efforts to introduce this valve to railroads?

A. I commenced in 1853, but had very ill success at first. The introduction of coal as fuel made such a device quite necessary. (Question repeated.) Well, about five years.

Cr.-int. 10. How many of the cars in this train which you went upon yesterday were just out of the shop, if you know?

A. I thought it looked as though there were two, if not three, just out of the shop; one, sure, the rear car.

2092 Cr.-int. 11. Were these two or three, and one sure, those which had the Springfield brake on them?

A. Two with the Springfield brake, and one with the Hodge brake. I may be mistaken as to the appearance of the car having the Hodge brake. It had a new platform on, what is called the Miller platform. It may be that that gave it the new appearance.

Cr.-int. 12. What was the number of this car having the Hodge brake on?

A. The number of the car having the Hodge brake, I did not observe.

(M'r Whipple stated that it was 134.)

Cr.-int. 13. Did you notice, before the train started, how well the Springfield brake on the cars in this train was adjusted?

A. I had no opportunity to notice at all. The train was in the depot in the dark; it was quite early, and I only noticed it after it ran out. I did notice it at the first station we stopped at.

Cr.-int. 14. How perfectly was the Springfield brake adjusted on the cars which had it?

A. It was adjusted, I thought, too tightly to work well. I will say, in explanation of that, the very tightness of the chain brought the chain round the barrel in contact with the nut; when it got a little looser by running, it wound up below the nut. I refer to car 123, in the rear of the train.

Cr.-int. 15. As you noticed these Springfield brakes, at the time the train had reached this first station of which you speak, did the slack of the chain seem to be all fully taken up?

A. The chains had not, I thought, sufficient slack. Indeed, it required but about half a turn of the wheel and shaft to tighten the brakes, and that brought the nut on the opposite side, in that half turn, directly in the wrong spot to pull well upon the chain.

Cr.-int. 16. Does or not this fact show that, for some reason, care had been taken to make the chains on the Springfield brake quite tight?

2093 A. I have no doubt the man who adjusted them tried to make them work with as little slack on the chain as possible, and thereby made a mistake. A little more slack would have worked better. Indeed, it worked better after the chains obtained a little slackness in use.

Cr.-int. 17. About how long did it take, after the train started, for these chains to acquire more slackness by use?

A. It seemed to improve at once in use—to slacken up.

Cr.-int. 18. Did there seem to come at once, or almost at once, a perceptible slackness of the chains in use, or such slackness as made, as you think, a perceptible difference in the operation of the brake in use?

A. I think it was a gradual sliding scale of slackness that it ran up to by use, until all the parts were brought up to a fair bearing.

Cr.-int. 19. Why, then, did you say that it seemed to improve at once, if it was gradual?

A. I don't think I used the best word there. I meant from that time, I did not mean with any sudden jump into slackness.

Cr.-int. 20. Then about how soon did the chain seem to become slack enough to produce this improvement which you speak of?

A. Well, I think as we approached what they call Charlton grade, which is about sixty miles from Boston. After that, I found no fault with it. We had been gradually working up to that point of efficiency. I speak particularly of car 123. (Question repeated.) The question is a hard question. Of course, the last clause of the previous answer meets that. I will say, it is not possible to fix the exact point when this brake was most efficient. It was a gradual sliding up to efficiency. It is not in my power to tell exactly when or where it was most efficient, or even truly efficient. I found no fault with if at the western end of this eastern division. It worked very efficiently.

Cr.-int. 21. So far as you could judge, did what you call the improvement in the operation of the Springfield brake begin soon after leaving Boston?

A. It did, at the first application of the brake, and it improved with every application of it.

2094 Cr. int. 22. In running the train over the distance thus spoken of, did the chains of the Springfield brake seem to gradually become more slack?

A. They did.

Cr.-int. 23. Should you think, from the way in which these chains were adjusted, before the train had reached the first station spoken of, that the man who adjusted the Springfield brakes had tried to adjust them as perfectly as in his opinion he could?

A. I have not the least doubt of it.

Cr.-int. 24. You have spoken of this nut on car 123. Was this nut on the back end of the eye-bolt?

A. Yes; where it passed through the windlass shaft, to hold the eyebolt in.

Cr.-int. 25. About how thick was that nut?

A. I should think it was half an inch. It looked like a very clumsy, large nut.

Cr.-int. 26. About how much, in parts of an inch, would the distance from the outside of the shaft, on the side where the nut was placed, be to the outside of the nut?

A. Well, considering the roundness of the shaft, I should think nearly three-quarters of an inch at the outside, owing to the squareness and roundness of the shaft being increased at the angles. I will say, in explanation of that, that I observed every time the chain caught, especially at the Ashland stop, there was a peculiar kink or link of the chain that carried it out to a much greater diameter than was due to the thickness of the nut; and it appeared to me that the real fulcrum was nearly two and a half or three inches from the centre of the shaft on which the chain was winding, by the peculiar location of the link of the chain on the nut.

Cr.-int. 27. Then the nut itself produced an obstruction of about three-quarters of an inch, did it?

A. I should think so.

Cr.-int. 28. How much did the outside of the eye-bolt project from the outside surface of the shaft?

A. I should think about an inch and an eighth.

Cr.-int. 29. Did you notice when the Springfield brake was applied on any of the cars, that the chains would kink around the eye-bolt in being wound up?

2095 A. I did not notice at all any kinking except on the front of this car, 123. The brake upon the baggage-car I noticed several times, and the chain wound very beautifully and evenly around the barrels, on all these occasions. I saw no kinking anywhere on the Springfield brake, except at this front end of car 123, in the rear of the train, over this nut.

Cr.-int. 30. Did you see M'r Sayles, who you say was present, wind up the brake several times on the front end of this rear car?

A. I did.

Cr.-int. 31. When he so wound it up, did you not notice that the chain kinked more or less around the eye-bolt?

A. I did notice M'r Sayles winding up and loosening it several times, in immediate succession, and sometimes it would catch around the eyebolt and sometimes it would not. Indeed, I got the impression that it was improving while M'r Sayles was working at it. I think his working it assisted in loosening it.

Cr.-int. 32. When the chain caught around the eye-bolt, how much did that shorten it; that is, how much did it quicken its winding, or how much would it take it up?

A. I can only answer it approximately. I think it shortened the chain an inch and a half. But that was not the worst difficulty—shortening the chain; it was practically increasing the size of the barrel on which the chain wound, and lessening the power exerted upon the brake. At one time, I noticed, when the chain was so caught, that practically the barrel was increased up to nearly three inches from the centre of the shaft; that is, the radius; one-half the diameter; at least two inches and a half.

Cr.-int. 33. In your judgment, what would be the comparative effect as to the power applied by the Springfield brake upon the two trucks of the car, when such a kinking of the chains as this takes place?

A. It would exert almost the entire power upon one truck of the car, and reduce that to about one-half its efficiency.

Cr.-int. 34. Did you observe whether there was a similar nut on the back end of the eye-bolt on the Hodge brake, which you say was in this train?

2096 A. I think there was. But the chain was slack, and it ran round the barrel directly below the nut. I am quite sure there was.

Cr.-int. 35. Suppose the chain had been so tight that it would have wound around the nut instead of winding below the nut, would there have been any difference in the effect of the Hodge brake upon the two trucks?

A. Not the least. The force applied would have been less, in consequence of this practical enlargement of the barrel, but it would have been equal on both trucks.

Cr.-int. 36. Did you notice whether or not car No. 78, the smoking-car with the Springfield brake on in this train, had also a nut on the back end of the eye-bolt?

A. I did not notice that car.

Cr.-int. 37. Did you notice whether the brake-shoes on those cars having the Springfield brake, fitted the wheels nicely and equally?

A. I thought they fitted the wheels nicely; but I thought the connecting-rod on the back brake of car 123 was the tightest, for the reason that it heated the shoes more running on down grades than the front ones.

Cr.-int. 38. You have stated in your direct examination that you observed that the application of the windlass-wheel and shaft on these Springfield brake cars was not sufficient to fairly develop the power of the brake. Please state what was the diameter of the windlass-wheels and of the portions of the shaft where the chains wound in those brakes?

A. I did not measure the wheel, but it looked to be about 16 inches, and the shaft at the bottom appeared to be an inch and a half.

Cr.-int. 39. These are the sizes commonly in use, are they not?

A. They are the sizes commonly in use.

Cr.-int. 40. During the portions of the time that you were employed upon the Hudson Railroad as you have stated, were you the master mechanic of that road?

A. I was.

Cr.-int. 41. What was the first form of double-acting brake which was used on the Hudson River Railroad while you were connected with it, if you know?

2097 A. It was the Tanner brake.

Cr.-int. 42. Are you familiar with the construction and operation of the Tanner brake?

A. I think I am.

Cr.-int. 43. Can you state upon about how many cars on the Hudson River road the Tanner brake was placed, during any portion of the time that you were master mechanic there?

A. The first that I recollect was a purchase of 500 freight-cars. If I mistake not, they all came to the road with it on. That is my best recollection. Whether or not it was applied to the passenger-cars just at that time, I cannot answer.

Cr.-int. 44. How was it afterwards?

A. Afterwards, they made experiments. Stevens called our attention first to the double brake, and I believe some of the cars had the Hodge on, but I am not sure.

Cr.-int. 45. Do you recollect whether these experiments of which you speak were under the charge of Major W. T. Ragland?

A. These experiments were under the charge of Mr. W. T. Ragland.

Cr.-int. 46. Were you called as a witness on behalf of the railroad company in a suit tried several years ago at Canandaigua, brought upon the Hodge brake patent against the New York Central Railroad?

A. I was.

Cr.-int. 47. Do you recollect being called upon to testify in that suit in reference to the effect upon the Tanner brake of the passage of a car with the brake applied on a straight track around a curve?

A. I do recollect.

Cr.-int. 48. Did you state in that testimony at that time, that if the tops of the truck-levers were so arranged that the line of draft from the centre-lever to the tops of the truck-levers would be as nearly as possible in a line with the king-bolts of the car, there would be no material difference in the effect produced upon curves by the Tanner brake, when a car with the brake applied passed from a straight track on to a curve?

2098 A. I did say so, and still say so.

Cr.-int. 49. There is no question in your mind, is there, about the correctness of this?

A. Not the least.

Cr.-int. 50. Was there considerable testimony given upon this point at said Hodge trial?

A. There was quite an effort to injure the character of the Tanner patent in that particular.

Cr.-int. 51. Did you make any mathematical calculations in reference to this point at that trial?

A. I did.

Cr.-int. 52. Will you please state, so that it can readily be understood, what the nature of that calculation was, and what the result of it was?

A. I made a calculation by figures of the lengthening and shortening of the rod due to a radius of 800 feet, I think, on the Tanner brake, and I found the greatest variation only $\frac{2}{1000}$ of an inch in length. I also made an experiment before the jury there with the radius bars, showing how infinitesimal the variation was in the Tanner brake, going around curves.

Cr.-int. 53. And did you at this trial testify in court to this slight difference, being only about $\frac{2}{1000}$ of an inch?

A. I did.

Cr.-int. 54. Please state whether or not this calculation of yours was based upon the assumption that the tops of the truck-levers in the Tanner brake were arranged so that the draft from the centre-lever to them should be as nearly as possible in line with the king-bolts of the car?

A. It was.

Cr.-int. 55. I understand you, that in your railroad experience since that time, you have seen no reason to change this view?

A. Not in the least.

Cr.-int. 56. You say you made a mathematical calculation at this trial; will you please state whether you have paid particular attention to mathematical subjects, and whether you have, in the course of your practical life, been frequently called upon for various purposes to make accurate and important mathematical computations?

2099 A. When I was quite young I was known to show a special aptitude for mathematics. I went through all the branches of mathematics before I was fourteen years of age, without any effort; and have since been called to make very complicated calculations, and never found any difficulty in making any calculation I desired.

Cr.-int. 57. Have you also been very familiar, practically, with important and complicated dynametrical experiments?

A. I have. I have made very perfect dynametric instruments, and have used them on railways in testing and measuring forces, very generally.

Cr.-int. 58. Have you also frequently been called on at various State fairs to superintend and conduct dynametric experiments, where nice results were required?

A. I have. I have made over 600 dynametric experiments with agricultural implements.

Cr.-int. 59. You have stated that at this Hodge trial at Canandaigua there was quite an effort made to injure the Tanner patent, in reference to the effect of the Tanner brake upon curves, as compared with its effect upon a straight track. Did that attack proceed from the plaintiff in that case?

A. It did; from the Hodge patent.

Cr.-int. 60. Was not the defence against that attack made, and the testimony you gave at the trial introduced, by the railroad company, the defendants in that case?

A. It was.

Cr.-int. 61. Have you or not, in your extensive railroad experience, become more or less familiar with the different kinds of double-acting brakes which from time to time have been used upon the railroads of the United States?

A. I have been perfectly familiar with all of them.

Cr.-int. 62. What is your recollection as to what was the first form of double-acting brake that was put into use by railroad companies?

A. My recollection is, that the first I ever saw was the Tanner.

Cr.-int. 63. Is it also your recollection that the Tanner brake continued in use by railroads generally until they adopted the Hodge brake or the Stevens brake?

2100 A. All that used a double brake continued the use of the Tanner brake until Hodge introduced his. The next step was to the Stevens brake.

Cr.-int. 64. Will you please state what has been your observation in respect to the use of double-acting brakes upon Southern railroads?

A. I do not know that I have any experience or observation of the Southern roads. None occurs to me now. My recollection is only a general recollection, and I cannot speak specifically at all.

Cr.-int. 65. Will you please state when you first heard of the Springfield brake?

A. I heard the name a great while ago, in these early cases, but never knew how it was made until last winter.

Cr.-int. 66. From whom did you learn how it was made last winter?

A. M'r S. M. Whipple told me how it was made. I had used that principle upon tenders, a long while ago, applied to one end of the car, and recognized his description, and judged of its action immediately upon that.

Cr.-int. 67. When did you first know or hear of the Springfield brake being used upon passenger-cars?

A. When I first heard of it, it was used at Springfield—a double brake—but I never knew its form or construction. I don't know whether it was used on passenger-cars or not. (Question repeated.) I first heard of its use on passenger-cars last winter.

Cr.-int. 68. You say you never saw it used until yesterday?

A. I never saw it used until yesterday. Understand, I have seen that same principle applied to tenders.

Cr.-int. 69. Please state whether or not it is important, in your judgment, in the running of passenger-trains, to apply the brakes to all the wheels of the train in making stops.

A. I do consider it of great importance.

Cr.-int. 70. Do you or not apply this answer to all the stops which a train has to make?

A. Well, I will say to all stops, but more especially to the sudden stops that are required to be made in rapid running. Its importance increases with the speed and the suddenness of the stop. 2101

Cr.-int. 71. Are you familiar with what are known as the air brakes, recently introduced upon railroads?

A. I think I am sufficiently familiar with them. I think I understand their action. One I have seen work, and the other has been described to me, so that I think I understand it.

Cr.-int. 72. Is there in any of these air brakes any other advantage over the hand brakes, than that the air brakes are, in the first place, under the control of a single mind, and that they apply the brakes to all the wheels of the train as nearly simultaneously as possible?

A. I do not know that there is any other advantage. True, the brakes work without brakemen, but yet the same number of men would be required as the gang of a train. I don't think it lessens the number. That is my present opinion.

Cr.-int. 73. Is the mechanism, and the application of it to cars and engine, more costly, and the expense of keeping in good repair greater with the air brakes than with the hand brakes?

A. It is, and for the reason that all the cost, expense, etc., of the hand brakes still continues, and this is in addition to it. I want to correct my answer in regard to those stops yesterday that I spoke of. I stated that the first stop was at Ashland. It was the first stop my attention was called to. What they call the Know-Nothing stop, at the Providence crossing, and the stops at Framingham, I paid no attention to. I had hardly got located on the train.

Redirect:

Int. 35. In your cross-examination, you have spoken of the Tanner brake, and stated that, under certain conditions, the power of the brake on the two trucks is comparatively equal, whether the car is running on a straight track or on a curve. How do such conditions, applied to the Springfield brake, affect its operation under the same circumstances?

2102 (Objected to because the witness did not say that it was "comparatively equal," but said there was no material difference in the Tanner brake between the power applied to one brake and the power applied to the other.)

(Question repeated in the light of the objection just made.)

A. Under the same conditions, the action of the Springfield brake is precisely the same as the Tanner. The conditions were, that the draft-rod from the centre-lever to the top of the truck-lever passed on a line with the king-bolt of the truck. Now, if the draft-rod in the Springfield brake passes from the windlass to the top of the truck-lever on a line with the king-bolt of the truck, the same rule will obtain, and the action will be the same in both cases. That is, the tension of the draft-rod and the action upon the brakes will not be seriously affected by the swivelling of the truck on passing from the straight line to a curve, or vice versa.

(Referring to "Defendants' Exhibit, Springfield Brake No. 2," the witness proceeded as follows:)

I now hold in my hand a model representing "Springfield Brake No. 2," in which the draft-rod from the windlass to the top of the truck-lever passes in a line nearly parallel with the sides of the car. In its present position the tension of the draft-rod will be affected by the swivelling of the truck measurably in proportion to the distance of the draft-rod from the king-bolt, at the point where it passes the bolster. Now, if I turn the top of the truck-lever over until the tension-rod practically passes through the line of the king-bolt, it is not practically affected at all by the swivelling of the truck. So with the action that takes place with the lever at the other end of the car. By turning the top of the lever over, to bring the draft-rod on a line with the king-bolt, it prevents the swivelling of the truck from affecting the tension of the draft-rod; and by the same law that I before stated in regard to the swivelling of the Tanner brake, the points of which were drawn out at Canandaigua.

Int. 36. By whom drawn out?

A. By M'r Hodge's expert.

Int. 37. Who, on that occasion, was M'r Hodge's expert?

A. M'r Hervey Waters, of Boston. I will here state that I consider M'r Hervey Waters one of the most accomplished of experts.

2103 Int. 38. What did he draw out on that occasion?

A. He overlooked the feature that I have now explained until it was presented to him, and I believe he then abandoned the idea at once, as a man of his sense would, and adopted my theory as correct. I will here state that I am not surprised that M'r Waters did overlook it, for M'r Tanner himself had overlooked it in all the practical applications of his brakes that I knew of up to that time; for, in all the brakes that I had seen M'r Tanner apply, he entirely disregarded the law I have just spoken of, and placed the draft-rods so that they would be affected practically by turning curves.

Int. 39. Are the conditions you have named observed in the every-day application and operation of brakes? If not, why not?

A. They are not observed at all; they are disregarded. The importance of it has been entirely ignored by the practical men who have charge of brakes. That is to say, they have never observed the want of it; and have never been careful to apply it in the best manner. I will state further that all the brakes I know anything of as they are practically used, are affected in some degree by the peculiar action that that takes place on curves.

For instance, I will commence with the Stevens brake and the Hodge. Whenever the draft-rod passes from the windlass to the top of the truck-lever, in either case, on a line parallel with the sides of the car, as is often the case, and the cars pass on to a curve, when the wheels of both trucks on the car are on the same curve, a perfect compensation takes place, so that the force upon the brakes is not affected by the curve; but in passing through a switch, where the different trucks are on curves reversed in their character, where one truck swivels to the right and the other to the left, the tension upon the draft-rod is increased or lessened, depending upon the exact position of the curve; and this action is general upon all the brakes; they are either tightened or loosened; and, as I have said that the same tension takes place in both the Tanner and the Springfield brakes, it includes all classes of brakes that I have to treat. I will say, that the difficulty in either the Hodge or the Stevens is not a practical difficulty in the least degree, I think. It exists
2104 in too small a degree to create any practical difficulty. I place the Hodge and Stevens in a class as self-adjusting brakes, and the Springfield and the Tanner as non-self-adjusting. By "non-self-adjusting," I do not mean to include the self-adjusting that is obtained by wear. In the early application of the Tanner brake and the Springfield brake, as I used it upon tenders, we used wooden shoes, and we generally considered that the unequal tension of the draft-rods would wear themselves into a good practical adjustment very soon through the wearing of the brake-shoes.

Int. 40. Please look at the drawings of a certified copy of the Thompson and Bachelder, or Tanner-brake patent, and compare the brake there represented with said brake as applied on "Defendants' Exhibit, Nichols-Tanner brake," and state whether it is practically the same brake?

A. Practically, it is the same brake. They are both of them imperfect in regard to swivelling. The draft-rod above spoken of does not pass in a line with the king-bolt of the car.

Int. 41. Which application is the more practical, the one seen in the drawings of the patent, or that seen in the "Exhibit, Nichols-Tanner brake"?

A. In what view "practical," M'r Whipple? Do you mean the most practical, or the best?

Int. 42. The best for every-day use as a car-brake, that represented in the drawings of the patent, or that represented in the exhibit?

A. M'r Whipple, I do not understand you really. You will have to explain.

Int. 43. Did you ever see the Tanner brake applied as represented in the patent? That is to say, the levers perpendicular to the centre of the car?

A. I never did, in practice.

Int. 44. Did you ever see in practice a Tanner brake where the truck-levers were connected with the centre-lever, as indicated in the drawings of the patent, as far in towards the centre-pin of the centre-lever as indicated in the drawings?

A. If my memory serves me right, I saw on the Camden and
2105 Amboy R. R. the Tanner lever and rods connected as shown in the drawing, in order to apply the McLaughlin bumping-brake. That is the only case that I now recollect.

Int. 45. In the case referred to, was the connection as far from the end of the lever as indicated in the drawing?

A. I think not as far.

Int. 46. How many inches should you judge from the end of the lever, assuming that the lever was four feet long?

A. I cannot state; I have no distinct recollection of the distance.

Int. 47. In view of the foregoing explanation, you will now please state in which the brake is more practically represented, in the exhibit, or in the drawings.

A. You must give the whole scope of the word "practically," in order to have me understand what you mean.

Int. 48. In other words, were you to apply the Tanner brake, would you apply it as in the drawings of the patent, or as in the exhibit before you, and already referred to?

A. I think I should apply it as in the exhibit. That is the way all the Tanner brakes have been applied that I have ever seen.

Int. 49. You will please look at the drawings of the Thompson and Bachelder patent, and make such remarks as you think proper in further illustration of the subject-matter in hand.

A. With regard to the line of the draft-rod in its passage from the centre-lever to the top of the truck-lever, it does not pass on a line with the king-bolt, but passes over to the opposite side, and where the line meets the bolster is some little distance from the king-bolt; and it is just in that degree affected by the swivelling of the truck. Consequently, the drawing is not perfect in that particular.

Int. 50. Assume that "Defendants' Exhibit, Lever Scales," are put into the truck-lever rods of either the Springfield or Tanner brakes, the proportions of the scale-levers being one to eighteen; that is, two inches in the short arm, and thirty-four inches in the long arm, and that the power between the tops of the long arms of the scale-levers is twenty-four pounds, what will be the power upon the long arms of the truck-
levers, and what the power upon the brakes of each truck,
2106 the proportions of the truck-levers being as five to one, or six
inches in the short arm to thirty inches in the long arm?

A. Where the force upon the scales is twenty-four pounds, as stated in the question, the tension upon the draft-rod of the truck-lever will be 432 pounds; the tension upon the connecting-rod from the fulcrum of the lever to the brake-beam will be 2,592 pounds, and the tension on the connecting-rod from the lower end of the lever to the opposite brake-beam will be 2,160 pounds. The force will be the same in all trucks of all brakes, under the same conditions of leverage.

Int. 51. Assume that the truck-levers of the Hodge brake are as above stated, and that the short arms of the scale-levers are one and one-quarter inches, and the long arms thirty-four and three-quarters inches, what power will twenty pounds on the tops of the scale-levers carry to the long arms of the truck-levers, and what to the brake-beams of each truck?

A. Under the conditions above stated, the force exercised upon the draft-rod of the truck-lever, which before was 432 pounds, is now 576 pounds; and the force upon the connecting-rod from the fulcrum of the truck-lever to the brake-beam, that was 2,592 pounds, will become 3,456 pounds; and the force upon the connecting-rod from the end of the truck-lever to the opposite brake-beam, that was 2,160 pounds before, becomes 2,880 pounds.

Int. 52. Look at "Defendants' Exhibit, Hodge brake," and state what office the worm performs on the windlass-shaft, and what the stop just back of said shaft?

A. The office of the worm is to take up the chain, and, it being made in the spiral or fusee form, to take it up rapidly at first, and slowly and very powerfully at last, when power is required. The stop is to save as much as possible the slack of the chain when the opposite windlass is at work, and also to hold the rod when the chain-connections are broken off, and allow the brake to be worked from the opposite end of the car.

Int. 53. Then, if I understand the matter, the Hodge brake at one end does not have to take the slack of the chain at the other end, when the stop before referred to is used?

A. It does not.

2107 Int. 54. What are your views of the comparative relation of the two trucks of a passenger-car to each other when the car is running under the application of the brakes to the wheels of the two trucks through the agency of the Tanner or centre lever brake?

A. The peculiar construction of the swivelling-bolster requires a certain degree of looseness, and from the fact that the longitudinal forces are above the point of bearing of the bolster in the truck, I have observed that upon the application to trucks generally there is a tendency of the trucks to fall back as the brakes are applied. My observation has been of the trucks on the Hudson River road, and I observe that they fall back, I should think, an inch in practice, judging by my eye only; I have never measured the distance; so that the force due to the application of the brake upon the truck, and the momentum of the car body, would have the effect to draw one truck, that is, the forward truck, nearer to the fulcrum of the centre lever, and the other truck, or back truck, further away from it, so as to materially affect the equal tension upon the two draft-rods; or, in other words, the back truck would experience more tension upon the draft-rod, and more force upon the brake-beams than the front one. There is a force, however, measurably tending to prevent that. That is, the tension upon the draft-rods themselves, which tends to draw the trucks together, or towards the centre of the car. I have never measured this, but in my estimate of forces the tension upon the draft-rod is not sufficient to overcome the power due to the action of the brakes.

Int. 55. What two forces are there to be overcome in a moving train before the wheels can be slid upon the track?

A. First, the rotation of the wheels, and the adhesion between the wheels and rail.

Int. 56. Will you please, under this head, illustrate the law of friction connected with the stopping of railroad trains, and state whether the power or force applied to the wheels by the brakes is just as effectual towards stopping the train at a high velocity as at a low velocity, and also whether the retarding force is according to the pressure, or according to the surface pressed upon?

2108 A. I was early taught that velocity or surface did not materially affect the question of friction, and all my experience and my dynametric experiments have confirmed that view; that is, that friction is not materially increased by increase of surface, or by velocity.

Int. 57. Does the sliding of wheels ever take place at a high velocity? If not, why not?

A. I have never seen it take place at high velocities. It is not apt to take place at high velocities, until a good degree of the power of rotation is consumed. When a force sufficient is applied, sliding will commence. That is, it is most apt to occur at slower speeds. That is, with reference to the running of railway trains.

Int. 58. Does a brake hold just as well with the same power when a train is running at a speed of thirty miles an hour, as when it is running at one mile an hour, or nearly at rest?

A. By the law I have just mentioned, the holding is not materially affected by the velocity.

Int. 59. Will or not a train be as thoroughly controlled when the aggregate force is unequally distributed on the wheels, as when equally distributed, provided that none of the wheels are slid?

A. It will be as thoroughly controlled.

Int. 60. What, if any, advantage is there, then, in having a truck that will, as far as possible, equalize the power on all the wheels of a car?

A. The advantage is in having the highest degree of efficiency or pressure upon the wheels, a holding power, without sliding any of the wheels.

Int. 61. Does the Stevens brake have these properties practically?

A. It has these properties theoretically.

Int. 62. But not practically?

A. Practically, there is a difficulty in so adjusting the Stevens brake without setting the brake-shoes too tightly to the wheels, from the fact that all the lost motion, or slack of connections, has to be provided for by the vibration of the end-levers, and these end-levers are 2100 frequently pulled out of proper vertical position by the action of the windlass rod upon the top of the lever; and practically they have to be adjusted so tightly that very often there is an undue friction of the brake-shoes upon the wheels to make the Stevens brake work efficiently. They used to complain of that feature upon the Hudson River road, and desired me, at one time, to make dynametric experiments to show that the friction was very great upon the Stevens brake-shoes. By their tightness, sometimes, the end-levers are pulled out of vertical position nearly on a straight line with the windlass-rod, which has a tendency to take off a large portion of the power from the wheels affected by that lever.

Int. 63. You have stated that you requested M'r Gardner to operate the Springfield brake on car 123 from the rear end. Please state what your object was in so doing.

A. I had in view developing all the features of the Springfield brake. The Springfield brake has peculiarities not possessed by any other brake, in this way: whenever the train is in motion, and the brake is applied to arrest the motion, the momentum of the body of the car above pressing forward, and the adhesion of the wheels below on the rail holding backward, by reason of the force of the momentum of the car body being applied to the truck at a point something like two feet and a half above the rail, the weight upon the forward wheels of the truck is increased, and a portion of the weight upon the back wheels of the truck is transferred to the front wheels of the truck. (When I speak of the weight, I mean the entire weight of the car, exclusive of axle and wheel.) Now, in the Springfield brake, the connecting-rods attached to the fulcrum of the truck-levers drew and acted upon the brakes of the front wheels of each truck, while the connecting-rods on the end of the levers drew and acted upon the hind wheels of each truck. By the superior force due to the power developed at the fulcrum of the lever, the brakes of the forward wheels of each truck would have an increased force, approximately equalling the increased weight upon the wheels, and the brakes upon the hind wheels of each truck would have a diminished force, approximately equal to the diminished weight upon them, and a greater 2110 aggregate force could be applied to the four wheels without slipping the wheels. This force and action do not in the aggregate increase the power of stopping the car by the tension of the brakes at the rear end, because the aggregate power would be the same in both cases, and the action the same in both cases; that is, the same whether the brake was applied from the rear end of the car or from the forward end of the car, as far as the development of power was concerned, if none of the wheels in either case slipped. But applying the brake at the end of the car would, in the experiment, have given full efficiency to the Springfield brake, in case it had produced any slipping of the wheels. In view of what I have stated, I consider that when the rods are evenly adjusted with the Springfield brake (by that I mean, adjusted so as to draw uniformly upon both trucks), when the weight at the rear of the car is applied, a greater power of holding the train without slipping the wheels is attained, than with any brake I have ever seen or heard of. I have been led into these reflections and convictions by observing that on cars where the Stevens brake was applied in the rear to each truck, the wheels were most likely to slip upon the application of the brakes when the force applied to each wheel was approximately equal; or, in other words, the wheel which had the least weight upon it would be the first to slip.

Int. 64. William T. Ragland, otherwise known as Major Ragland, has testified in behalf of the complainant in this case, to wit, July 27, 1871, in relation to certain tests performed by him on the Hudson River road, about the year 1852. Have you any knowledge of such tests being made on the cars of that road? If so, what do you know about them?

A. I have knowledge of the tests spoken of. When I took a position on that road under M'r Starks, I was placed in nominal charge of the entire mechanism of the road, the rolling-stock. However, under that, I never interfered with either department, except the locomotive. I continued in that nominal charge until M'r French took charge of the
road in 1853. I think during the summer of 1852 M'r Stevens,
2111 the patentee of the Stevens brake, brought there his models and
plans, and we all approved of the plans, and they were applied at
once, in an experimental way, to a car in M'r Ragland's department, and the trials proceeded. There were several objects to be attained by the Stevens brake. It was to attain greater efficiency in making sudden stops; also, to save the wearing of wheels; and I watched the experiments with considerable interest. The trials resulted favorably, and the Stevens brake was approved, the patent purchased by the company, and the brake applied to the cars.

Int. 65. Do I understand that these tests were made as between the single brake and the Stevens, or between it and the Tanner brake?

A. I have no recollection of ever seeing the Tanner brake on a passenger-car on the Hudson River road.

Int. 66. M'r Ragland has stated that as the result of those experiments he came to the conclusion that the Tanner brake would wear out only one set of wheels where the single brake would wear out three sets of wheels. Is that true in relation to the Stevens or any other brake?

A. It cannot be possibly true with reference to that trial, for the reason that the trials were only, as M'r Ragland says, for four months, and the warranted life of the wheel, the builders' warrant, was for twelve months under any condition, whether single or double brakes were used.

Int. 67. Then there was no comparison, at these tests, as between the single brake and the Tanner brake?

A. I know of no such comparison. I do not think that any such comparison was made.

Int. 68. How does the weight of cars, as used thirty years ago, compare with the weight of those used at the present day; and also, how does the speed of those times compare with the speed of the present time in running trains?

A. I think it is very near the truth to say that cars are now a little more than twice as heavy as they were thirty years ago, and that the speed has very considerably increased in that time. I think it is safe to say that the speed has increased thirty-five or forty per cent., on the average, over that day.

2112 Recross:

Cr.-int. 74. If a wheel under a car, when the brake is applied, commences to slide, about how far do you think, under ordinary circumstances, it will slide before a flat spot begins to be worn on the periphery of it?

A. It commences to be worn immediately, on the moment of sliding.

Cr.-int. 75. How far do you think a sliding car-wheel must slide before the flat spot, which you say commences to be worn immediately, will become so much worn as to injure the wheel?

A. A good wheel is susceptible of a good deal of sliding. By "good wheel," I mean a wheel uniformly hard over the whole surface.

Cr.-int. 76. Take car-wheels as they have been on the average during the last twenty years, and then answer the question.

A. The question calls for a specific distance, and that will vary with all the varying conditions. A wheel will slip easier when the rail is wet and muddy than it will when it is dry and gritty. In that view of it, it is almost impossible to give any distance. It depends, also, upon the weight of the car and the condition of the rail.

Cr.-int. 77. Take, if you please, a dry rail, and a passenger-car of the average weight, if you know what that is, during the past twenty years?

A. You ask for a specific distance, and that would vary with every circumstance. I cannot answer the question any more specifically. I will state, further, that at the same time we tested several wrought-iron wheels of English make, and they experienced, probably, their proportion of sliding; yet it was never discovered that their sliding affected the tread in the least.

Cr.-int. 78. Do you know what was the average weight of passenger-cars upon first-class railroads between the first of January, 1850, and the thirty-first December, 1864?

A. I do not.

Cr.-int. 79. Can you give any approximate judgment about it derived from your railroad knowledge?

2113 A. I think I can.

Cr. int. 80. Please do so.

A. I weighed several passenger-cars about 1853, and they weighed eleven, twelve, and sometimes thirteen tons, depending upon their length; and from that time cars have been increased in ornament and strength, gradually running up to about twenty tons at the present day; and, judging from that gradual increase of weight that I know they have experienced, I should think that at the time spoken of cars would weigh fifteen or sixteen tons. That is my judgment.

Cr.-int. 81. Now, suppose that the wheels of a passenger-car, weighing fifteen tons, and running upon a dry rail, began to slide under the application of the brakes, and assume that the wheels are, as the question just above called for, of the average quality which wheels have had during the last twenty years, about how far, to the best of your judgment, must such wheels slide before the flat spot becomes sufficiently worn to injure the wheels?

A. I cannot answer that question.

Cr.-int. 82. Why not?

A. You speak of the "average quality" of wheels. There are a great many wheels that are very defective in their hardness. They have soft spots upon them, with little or no chill or crystallization in these spots, and if a wheel happens to slide upon this soft place, it will be injured almost immediately. If a wheel is an evenly hard chilled wheel, as all wheels ought to be, it will slide a very great way without any perceptible alteration in it at all. I have worn wheels for over four years without any replacement. Hence the difficulty of answering the question under any average condition. I cannot say how far a wheel can run.

Cr.-int. 83. Do you think that wheels that would wear four years without any replacement are average wheels, as car-wheels have been during the last twenty years?

A. No, sir.

Cr.-int. 84. Do you know about how long car-wheels of the average quality, which have been in the market for the last twenty years, will wear in passenger-trains, under ordinary circumstances, on first-class roads?

2114 A. I know it was the habit of the Hudson River road to exact a warrant for one year. They would frequently wear three or four years. You can draw your own inference of average from that. I cannot answer the question any further. I have never kept any statistics of the average wear of wheels.

Cr.-int. 85. Would they also frequently wear less than one year?

A. They would frequently give out in less than a year. In that case they were put back upon the makers as bad wheels.

Cr.-int. 86. In how short a time did they sometimes give out?

A. Almost immediately. Those immediate cases, however, were mostly cracks, detected flaws.

Cr.-int. 87. Do you know what a car-wheel of average quality at the present time is?

A. I am not as familiar with the wheels of the present time as I was formerly. I have paid but little attention to modern wheels.

Cr.-int. 88. For how many years were you familiar with car-wheels?

A. Well, from 1838 to 1854, and a good deal of the time since that, by my indirect connection with the wheel-makers, Barnum & Richardson.

Cr.-int. 89. How much of the time since 1854 have you been familiar with car-wheels?

A. Well, I will say all of the time. I have kept up my familiarity with them. I am almost daily seeing them, watching their actions, and discussing, and hearing discussed, their relative merits.

Cr.-int. 90. Do you know what was the average quality of car-wheels used by first-class railroads between January, 1839, and December 31st, 1864?

A. The average quality of the wheels was pretty fair, and I believe generally improving in their strength during that period.

Cr.-int. 91. Can you say approximately how long a wheel of pretty fair quality would have to slide on a dry rail, under a passenger-car weighing fifteen tons, before a flat place, commencing to be worn in it when it began to slide, would be sufficiently worn to injure the wheel?

2115 A. Well, I have found in my experience it varied very much with the nature of the ballasting of the road; that in sandy regions where the rail is liable to be gritty, it would wear faster than it would where the ballasting was grassy and weedy.

Cr.-int. 92. What is the usual ballast of first-class railroads?

A They generally desire good, substantial gravel, where it can be had; but they are sometimes compelled to take up with very dry and gritty sand. There are large tracts of country where gravel cannot be had at all, as, for instance, on Long Island. I will say the lower section of the Hudson River R. R. had no gravel within forty miles of New York, and a great deal of the New England territory is without gravel.

Cr.-int. 93. Take a road with gravel ballast, and give your judgment.

A. I will say in answer to that, that gravel contains more or less soluble material in it, which is very lubricating to the rail; a muddy mixture. It will vary with every varying condition I have mentioned. I cannot answer specifically the question as to time or distance.

Cr.-int. 94. Do you understand that the question asks you to answer it specifically?

A. I have so understood it.

Cr.-int. 95. Are you able to form any judgment whatever, under any circumstances, as to how far a car-wheel, under the conditions assumed, must slide before a flat place commencing to be worn when the sliding begins, will be so much worn as to injure the wheel?

A. I am not able form any judgment, nor do I believe it in the power of the human mind to form an exact judgment on this question. All the variations and conditions involve a sliding-scale.

Cr.-int. 96. Do you understand that you have been asked to form an exact judgment?

A. I do understand so.

Cr.-int. 97. You have said in your direct examination that in a car
having swinging bolsters, and having the Tanner brake, when the
2116 car is in motion, the forward truck draws towards the centre-lever,
and the rear truck draws away from it; and you have also spoken about the effect upon the trucks when the brake is applied to the car. Have you ever, yourself, tried the application of the brake under these circumstances, so as to be able to observe accurately the relation which the trucks assume to the centre-lever under these circumstances?

A. I have not.

Cr.-int. 98. You have also testified on your direct examination that, though there is a tendency upon the application of the Tanner brake to draw the rear truck towards the centre-lever, that tendency is not enough, in your judgment, to overcome the force tending to make the truck hang backwards. Do you consider that this characteristic in the Tanner brake (if it be in it) is sufficient to materially injure the Tanner brake for a practical brake?

A. I cannot say. When we consider what latitude is allowed all brakes with reference to unequal action upon the wheels, the Tanner brake tried by the same rule would not be materially affected.

Cr.-int. 99. Referring to your answers in your direct examination in regard to sliding wheels at high velocities, please state whether car-wheels may slide when the brake is applied to them, when the train has a velocity of twenty-five miles an hour.

A. They may be made to slide at that velocity. I have seen it done by the Creamer patent brakes, where the brake is applied suddenly. But the first part of this answer refers to hand brakes that are applied more gradually.

HENRY WATERMAN.

Deposition of William O'Brien.

Int. 1. Are you the William O'Brien who was examined in this case on September 23d, 1872?

A. I believe so. I don't know exactly the date. I believe I was here some time in September.

Int. 2. Since you gave your evidence on that day for the
2117 complainant have you operated the Springfield brake on Jennings' train?

A. No, sir; I have not. The last of my using the Springfield brake will be a year next June—I believe along the 5th June—until yesterday.

Int. 3. On what part of Jennings' train yesterday did you act as brakeman?

A. Well, when we left here I was braking between the passenger-car (that is, the second passenger-car from the rear) and the smoking-car at the Providence crossing. I broke on the Springfield brake on the smoking-car—the hind end of it.

Int. 4. Did you continue to brake on the smoking-car of that train through to Springfield at all the stopping-places?

A. No, sir; after that I went up upon the baggage-car and postal-car, where I formerly broke.

Int. 5. Did you brake on both cars at that time?

A. No, sir; I had only one brake—the forward end of the baggage-car.

Int. 6. On what car did you brake from Springfield to Albany?

A. On the smoking car, forward end.

Int. 7. Was the brake used on all the cars that had the Springfield brake on from Springfield to Albany?

A. I believe not. The brakeman who was with me (I didn't know the road) broke with me between the baggage-car and smoking-car; he used the baggage-car brake and I used the smoking-car brake.

Int. 8. Was the brake put up on the express-car next the engine?

A. I don't think it was; I didn't see anybody on it.

Int. 9. Then you wish to be understood that one car in the train with the Springfield brake on was not used at all between Springfield and Albany?

A. I believe not; I didn't see anybody on it.

Int. 10. What brakes were relied on to take the train through from Springfield to Albany?

A. The three Springfield brakes and the Hodge brake.

Int. 11. Name the cars that had the Springfield brake on.
2118 A. I cannot give the numbers; the postal car, the baggage car,
the smoking car, and one passenger carriage.

Int. 12. Do you know the number of the passenger car?

A. 123 I believe it was.

Int. 13. What was the number of the car that had the Hodge brake on?

A. I don't know; I believe it was 134. I am not used to the numbers of the cars.

Int. 14. What can you say as to the operation of the Springfield brake on the cars which you broke on from Boston through to Albany?

A. Well, the smoking car, when I took it, had a Springfield brake on, and I thought that it had not been used at all; it was quite stiff when I first took it; the hind end had been used by me some at the Providence crossing; the forward end had not been touched, I believe. I won't be positive where I did commence to use it. I think it was at Springfield that M'r Waterman told me to use the forward end of the smoking car.

Int. 15. Did the brakes get finally limbered up so that they worked well?

A. My brake worked so it was quite limber after we made two or three stops. I used to work it back and forth so as to limber it up. It was kind of stiff, and I am not very tall, and the shaft was quite high, so that I didn't have as good a purchase as I should if it had been as low as brake-shafts generally are.

Int. 16. Do you think that the wear of the brakes was taken up rather too short for good action?

A. Well, I think it was pretty short; when I first commenced to use it the chain was very taut.

Int. 17. What kind of stops did you make, as a general thing, over the whole road from Boston to Albany?

A. Well, from Boston to Springfield at some of the stations we made very fair stops; at some stations we did not; we ran by twice, I believe.

Int. 18. At what stations?

A. We ran by at Ashland and Spencer.

Int. 19. At all the other stopping-places you made good stops?

(Objected to as leading.)

2119 Int. 20. If you did not make good stops what kind of stops did you make?

A. I said at some stations we made very good stops; and there was another place we ran by called Schodack; I believe it was the last stop we made.

Int. 21. When you speak of running by, how many car-lengths did you run past the station where you ought to have stopped to make it a good stop?

A. Upon the western end I don't know anything about the stations anyway. I should call it a barn more than I would a station. I know we went by the stations; at least we went by so that they didn't back up to them. Why I make that remark, sometimes where there is baggage to take off or put on we have to back up when we go by.

Int. 22. Did you back up to any station?

A. No, sir.

Int. 23. Is the station which you called Schodack on an up-grade or a down-grade?

A. I cannot say, because I never was over the road before.

Int. 24. What is your opinion about it; do you think it was on a grade or on a level track?

(Objected to.)

A. Well, I cannot say; I never was over the road before; I don't think it was very much down-grade or very much up-grade.

Int. 25. Very nearly a level grade?

A. I should say so. It might be a down grade for what I know.

Int. 26. Where did you make the best stops, on down-grades or level grades?

A. We made the best stops on level grades. I never knew a train where they could make as good stops on a down grade as on a level grade.

Int. 27. Did you make good stops on the down grades?

A. We didn't go into the stations as fast. We didn't run by any stations only those three that I mentioned.

Int. 28. Did you make good stops all the way upon the western slope of the Green Mountains from the station called Washington to Pittsfield?

2120 (Objected to as leading.)

A. Well, I said we didn't run by. Making good stops and making the stops we made yesterday is two different things. I say we didn't run by. I was a stranger on the road. Perhaps what they would call good stops I would call bad stops.

Int. 29. You didn't run by the stations?

(Same objection.)

A. We didn't run by the stations.

Int. 30. In running the said train from Worcester to Springfield did you make what you call good stops at the several stations?

A. Some stations we did and some we didn't.

Int. 31. Which stations do you think you made good stops at?

A. Well, we made a very good stop with West Brookfield.

Int. 32. What do you mean by not making very good stops?

A. Well, drag into a station; let them brake up and then run by.

Int. 33. When you drag into a station it is evident you put on the brake too soon or too hard, isn't it?

(Objected to.)

A. In some cases, and in some it isn't.

Cross-examined by M'r Cozzens:

Cr.-int. 1. On this trip yesterday where you broke with the Springfield brake, did you, in making your stop, begin to brake any further back than you do in making stops with the Hodge brake?

A. Well, in some cases I did, for the very reason that I didn't know how the brake was, not having used it for so long. I didn't know whether I could put any dependence upon it or not or any other brake. If they had been my own cars it would have been different.

Cr.-int. 2. About how many times did you begin to apply the brake further back from where the stop was to be made than you did with the Hodge brake?

2121 A. Well, I did going into West Warren for one place, and into Brimfield I believe it was. They are both down-grades around curves.

Cr.-int. 3. Did you see anything upon this trial with the Springfield brake yesterday to induce you to change in any respect the testimony you gave in this case about the Springfield brake on the 23d of September, 1872?

A. Well, that is a kind of hard question.* This brake that I had yesterday had just come out of the shop; it was in the highest point, I suppose, of working order, though I don't know whether it was or not; but I noticed yesterday, when I first took this brake, it worked very well sometimes; but as I worked it longer, it seemed as though the slack was more changeable; it would not catch so quick.

Cr.-int. 4. And would not work so well?

A. Well, it required a great deal more muscle. I noticed in going into Schodack—in fact, I didn't have much chance to see where we were, but the fellow said we were on the station, and I commenced braking and broke as hard as I could, and when we went by the station I was braking.

Redirect:

Int. 34. In braking on the Boston and Albany road do the brakemen have to exercise their judgment as to where to put on their brake, or are they governed by the whistle?

A. They exercise their own judgment; at least I always do. I wouldn't give much for a man who does not.

Int. 35. Then I infer that it was lack of judgment in putting on the brake at Schodack which caused you to run by; you did not put it on quick enough?

A. How should I know where the station was? I never was there before in my life. I was not any more lacking in judgment than the other brakeman was; he said he would make a good stop.

Int. 36. You, of course, were not familiar with that station and with what was requisite to make a stop there?

A. I was never there before; I broke according to his orders.

2122 Int. 37. Which brake, the Hodge brake or the Springfield brake, could you form the best judgment as to where to begin to brake in order to make a stop?

A. The Hodge brake, by all means.

Int. 38. Nearly all your practice as a brakeman has been with the Hodge brake, has it not?

(Objected to.)

A. Yes, sir.

Int. 39. Did you or not find it difficult to judge accurately in reference to the place to apply the Springfield brake, from the fact that your mind was trained to the Hodge brake?

(Objected to.)

A. Well, as I said before, I didn't know the road. I suppose if I had had my own two cars with the Hodge brake, it would have been different.

Recross:

Cr.-int. 5. What was the name of this other brakeman you speak of who told you when to brake?

A. I cannot tell you, sir; I didn't ask his name, although he knew me very well; it was the forward man.

Cr.-int. 6. Do you know whether he was a regular brakeman on that division of the road?

A. Oh, yes, sir; he has been on there for a good while.

Cr.-int. 7. And on that train with the Springfield brake?

A. Yes, sir. I had to go by him. I didn't know about the road. It would have been different if I had known the road.

Cr.-int. 8. You say you are not familiar with the stations on the western division of the Boston and Albany road. Are you familiar with the eastern division from Boston to Springfield?

A. Yes, sir; I am.

Cr.-int. 9. How long have you been a regular brakeman on this eastern division?

A. It is five years last month, I believe, since I came on the road. I was off the road about a year, very nearly. I was sick a little while, and on the Eastern road.

Cr.-int. 10. Would you, as to this eastern division, rely upon your judgment as to where to begin to apply the brakes?

2123 A. Oh, yes, sir.

Cr.-int. 11. And yet, notwithstanding your familiarity with this division, you ran by stations yesterday with the Springfield brake?

A. Yes, sir.

Cr.-int. 12. Suppose, on the trial yesterday, you had had no car in the train with the Hodge brake on, but only car swith the Springfield brake on, do you or not think that the train would have run by many more stations than it did, having one car with the Hodge brake on?

A. Well, I don't know. I can't say as we would have run by, because we would have been more careful of the train; but I don't think we could have made such good stops, because we would have held the train slower, and slowed it down to the station.

Cr.-int. 13. You would have commenced to break up sooner?

A. Oh, yes.

Cr.-int. 14. Do you know how many brakemen are usually carried on that train?

A. Well, they have three from Boston to Springfield, and two from Springfield to Albany.

Cr.-int. 15. How many did they have yesterday?

A. Well, they had five from Boston to Springfield, and four from Springfield to Albany.

Cr.-int. 16. Did they all work at the brakes?

A. They all did from Springfield to Albany.

Cr.-int. 17. How many did from Boston to Springfield?

A. There were four of us. On account of not using the Hodge brake on this end, the fifth man did not work between Boston and Springfield.

Redirect:

Int. 40. Do you or not understand that the Hodge brake was not used at all between Boston and Springfield?

A. Yes, sir; that is what I understood. I did not see it used. I think it was used at the Providence crossing, but I won't be positive.

Int. 41. Then, if I understood you, the four brakemen operated each a Springfield brake from Boston to Springfield?

2124 A. Yes, sir.

Int. 42. And the three brakemen from Springfield to Albany operated each a Springfield brake, and one a Hodge brake?

A. Yes, sir.

Int. 43. Leaving a Springfield brake that was not operated at all?

A. Yes, sir.

Int. 44. But the four men did not do any more work than two men might have done had each man stepped over to the other platform?

(Objected to as leading.)

A. Well, four men can do more work than two can on a train, because they both brake together; those four brakes are coming right up snug. While a man is setting one brake he has not power to set another. If the brake ahead of him was the rear brake it would do well enough.

Int. 45. Is that the main object of the double brake—to enable a brakeman to brake on two cars?

A. Do you mean to say that one man can set two brakes as quick as two men?

Int. 46. No; but putting time out of the account, cannot one man set up two double brakes as hard as two men can, by stepping over to the adjoining platform, after he has put on one brake, and then putting on the other—give him all the time he wants?

A. Well, that don't do, going into a station, you know.

Int. 47. I ask you if he could?

A. I don't know. Perhaps the man setting the brake on this side may be stronger than I am, or set it up harder. Take a brake when it is new, and let a man set it; if there is too much damned paint on it, as there generally is, he can set the brake hard; but when the train starts he can't let it off; it will stick too hard. Now, take my two brakes; I can set them up pretty hard; perhaps some men could let them off, and some could not.

Int. 48. Do you daily set up two brakes, one on one car, and one on the car opposite?

A. Yes, sir.

Int. 49. Can you set up two brakes as tight as another man could with the same strength and skill as yourself?

2125 A. Well, I don't know about that; perhaps he might set it a notch harder than I could, and perhaps I would set it a notch harder than he could. It depends on what I was setting for.

Int. 50. Can you set up two brakes as tight as you can either one of the two, one right after the other?

A. I don't understand that.

Int. 51. Can you set up the brakes on two cars, opposite each other, one as tight as the other, having time?

A. Well, one might not work as well as the other; it might not hold so well.

Int. 52. Provided they are in equally good order?

A. Well, if they are both the same kind of brakes, may be I can, and may be I can't. Perhaps I may be a little stronger when I am on this brake than when I am on that; my wind is a little better.

Deposition of George H. Gardner.

Int. 1. Are you the George H. Gardner who was examined by the complainant in this case on September 21st, 1872?

A. Yes, sir; I don't know the day and date.

Int. 2. Did you state in the deposition then given that you would, if called upon, go on to Jennings' train, on the Boston and Albany road, and operate the brakes thereon, and report the result?

A. Yes, sir.

Int. 3. Have you done so?

A. I have, sir.

Int. 4. When?

A. Yesterday.

Int. 5. Will you now state in detail what car you operated the Springfield brake on, and with what results?

A. I operated the brake on car 123 from Boston to Springfield.

2126 Int. 6. Go on, and take the different stations in detail, and state the results as to whether you made good stops. At the stations, say where you ran by, and state the circumstances connected therewith.

A. Well, we started from Boston at five o'clock. Our first stop was at the Providence railroad crossing.

Int. 7. State what kind of a stop that was, in your judgment.

A. I think we made a very good stop there. We then went on to South Framingham, where we crossed the South Framingham and Mansfield road. We made the Know-Nothing stop there. I think we stopped very well there. We then dropped down to the station, dropped down very well; it is only a short distance. The next station was Ashland; we ran by that station.

Int. 8. Please state the condition of your brake on running by.

A. I had set the brake at three stations before arriving there, and when I set my brake there, I set it as hard as I could, but I could not keep my car away from the rest of the cars ahead of it.

Int. 9. On examining the brake, what did you find the condition of the chains? Had they wound uniform'y round the windlass? If not, why not?

A. There are two chains winding round the windlass, and I found that the upper one had caught on a nut that there was there, so that the chains had not wound up even. I found that one was drawn up very tight, and stepping down the steps and feeling under, I found that the other chain was not drawn up tight.

Int. 10. So that there was but little or no power on one brake?

A. There could not have been much power on the lower chain.

Int. 11. The other brake was obstructed by the chain winding over the nut?

A. That was some obstruction, I presume; but I had set the brake as hard as I possibly could set it.

Int. 12. Well, passing that station, proceed to the next, and so on through to Springfield.

2127 A. Well, I didn't mark anything very great in the change of the stops along until we came to Spencer. We stopped at Charlton, and coming down Charlton grade, we came round a very sharp curve, over a dry bridge, or street bridge, and I held the slack of the train a little there, and held the brake with my hand. I kept the cars as steady as I could. I didn't set the brake hard enough as I considered to check the train any; merely did as I have done before when I worked on the road, held the slack of the train to keep the cars steady.

Int. 13. You did that with this brake?

(Objected to.)

A. I did that, after we passed that curve—that is all curve, a sort of reverse curve there; we crossed a highway somewhere east of Spencer. When I used the Springfield brake on the train before, I always made calculations to set that brake up as hard as I could there; that is nearly a quarter of a mile, I should think, from the station. I always commenced to brake a great deal sooner with this Springfield brake than with the Hodge brake, and I did yesterday. I commenced sooner yesterday at that place to set my brake as hard as I could, but I could not do any more than stand and look at it. I had orders not to use the brake on the other car, and we ran by the station.

Int. 14. How much?

A. Well, what I call running by a station is running by so that if there is baggage to get out or put in, they have to go down into the ditch, or back up, to get it into the car.

Int. 15. Did they have to go down into the ditch to put the baggage into the car this time?

A. I do not know as there is any ditch at that station; but when we have five cars, the rear car comes very near the end of the platform. We calculate to let the cars run up so that the passengers in the rear car can have the benefit of getting out on the platform. The rear car ran down nearly opposite the station; probably two cars further than as a general thing.

Int. 16. Now proceed to the next station, and tell us what the stop was, and so on.

A. I noted no great difficulty in going on to Springfield.

Int. 17. In going down the grade this side of Springfield, did you set the brake to go down on car number 123?

2128 A. Yes, sir; lightly.

Int. 18. Was any other brake applied for that purpose?

A. Not that I know of. I was on the rear car, and I had no way of knowing what they were doing.

Int. 19. Is it usual to steady the train by using the brake on the rear car?

A. Yes, sir.

Int. 20. After leaving Springfield, please state what position you took on the train, and what labor you performed, and on what car.

A. After we left West Springfield, I forget just exactly where I was, I went up ahead on the smoking-car, stopped there a few moments, and then I went back to the rear of the train, after crossing the river at West Springfield. I was never beyond Springfield, and knew nothing about the stations, nor where they stopped.

Int. 21. After you came to the mountain, what did you do about letting the train down the western slope?

A. I think the station they called Washington is on the summit. I noted that when we got up to the top of the summit, they pitched down, and they didn't have but a short time to run before they stopped at a station.

Int. 22. Tell us how you stopped, and what you did towards stopping.

A. I didn't have anything to do with stopping at that station, but I noticed that M'r Taylor, the brakeman on the rear car, set up the brake on car 123, and stepped over on to the other car, 134, and undertook to set that brake (the Hodge brake) up; somehow or other the chain wound up over the nut, and went above, so that he could not set it, so he let it off, and commenced to wind it up again, and got it right that time; and I heard the conductor ask him how he came to run by, and he explained how the brake caught, and he could not set it; so I judged we ran by.

Int. 23. The reason why you ran by was because the Hodge brake was not used?

(Objected to.)

A. Yes, sir.

Int. 24. Did you take a position on the rear of the train and set up the brake, and through its agency hold the train down the western slope?

2129 A. I was told by M'r Waterman to go back on the rear of the train and set up the brake as hard as I could set it, going down the grade, so that he could see how it worked. I went back and set the brake up as hard as I could; whether I took the slack of the train or not I cannot say, because I had no way of seeing; I was on the rear of the train.

Int. 25. But M'r Taylor, after you applied the brake, signalled to you to let off the brake?

A. He signalled to me to let go.

Int. 26. What did you infer he meant by signalling to let it go?

A. I didn't know whether we had got to the foot of the grade, whether he wanted us to go faster, or what it was; but he made the signal, and I let go about half of it.

Int. 27. Did you infer the brake was braking too hard for the proper speed of the train?

A. I presumed from his making motions that he had orders from M'r Waterman to let them go. After he gave me the motion to let the brake go, I let the brake off about one-half, and M'r Waterman came through to see how it was. He wanted to know how it was, and I told him I had eased it off, and then I set it up as hard as I could again.

Int 28. And by so doing, did you or not ease the train down properly into the station at the foot of the grade?

A. I cannot answer that, because I was not acquainted with the road and do not know where the foot of the grade was; but I set the brake up the second time as hard as I could, and held on the brake until I judged I was pretty near on a level, and let it drag somewhat, to see if the engineer would whistle "off brakes," but as he didn't whistle off brakes, I let go the brake, and went through the car to the other end.

Int. 29. Did you let it off from the fact that your judgment told you it should be let off?

A. That was the opinion I had of it. My judgment was that I had no business to drag the brakes when there was no need of it, without I had orders to.

2130 Int. 30. If I understand you, your reliance was made entirely on the Springfield brake on car 123, to take the whole train down the western slope of the Green Mountains to the foot of the grade?

A. Steady the train down.

Int. 31. Well, after you got to Pittsfield, what further labor did you perform on car 123 from thence to Albany?

A. I took no further part in it on that car. I did not know the stations, nor how they stopped. M'r Taylor preferred to stand on that car, so that he could look out and see where they were going. We went into a number of stations, and he told me where there was a down grade to the stations, and when he commenced to brake, I stepped over on the opposite car, 134, and set that brake, and he made me motions when to brake up hard. I set it up a number of times as hard as I could set it.

Int. 32. Did you find any difficulty in winding the two chains upon the windlass shaft on the rear end of 123?

A. No, sir.

Int. 33. Did you operate the Springfield brake upon either of the other cars from thence to Albany?

A. No, sir.

Int. 34. Then your services were virtually closed after you took the train down the grade this side of Pittsfield?

A. No, sir; I consider that I was on duty all the way through; I watched M'r Taylor's motions, and used the brake.

Int. 35. I mean, you did not use the Springfield brake after you took the train down the western slope of the Green Mountains?

A. No, sir.

Cross-examined by M'r Cozzens:

Cr.-int. 1. How perfectly do you think the Springfield brakes were adjusted on this train, when the train started?

A. I think when we started from here yesterday, they were adjusted just as perfectly as they possibly could be.

Cr. int. 2. About how soon do you think it was, after leaving Boston, that the chains began to get perceptibly slacker?

2131 A. I don't know anything as to that. We made our three stops this side of Ashland, and then the brake worked badly there, by the chain catching over the nut. After that, I set the brake up so as to get the slack of the chains, and took my pencil and marked it on the ratchet—the Springfield brakes got out of kilter so many times when I have used them—to see if there would be any change in them, after they had been so properly adjusted between Boston and Albany. Well, I worked the brake along until I got to Springfield. When I got to Chester, M'r Taylor set the brake up, and turned it just one-half of a turn more than what I had it when I left Ashland. I asked him if he had got it set up as hard as he could, and I stepped over and took hold of it, and set it up one notch further; and I didn't strain myself nor work any harder than I did at Ashland.

Cr.-int. 3. That shows, does it not, that the chain had got slacker that much between those points?

A. Yes, sir.

Cr.-int. 4. According to your experience with the Springfield brake, does it work better or worse as the chains get slacker?

A. In my judgment I should think they would not work so well. The longer they work them, the more they get out of adjustment. To have them work first-rate, they ought to have a man on the train all the time to look after them, and adjust them—keep them in order.

Cr.-int. 5. According to your experience in this trial yesterday, did or not the Springfield brakes hold the train, on the whole, as well as the Hodge brake would hold the train under the same circumstances?

A. No, sir; I don't think it did.

Cr.-int. 6. How long an experience have you had as a regular brakeman with the Hodge brake?

A. I have been braking with the Hodge brake all the time for about six years. There were four months that I was off duty at one time, and I was freight brakeman part of that time.

Cr.-int. 7. About how much time have you been regular brakeman on passenger trains on the Boston and Albany R. R., eastern division, where the brake used was the Hodge?

2132 A. I was on a number of different trains on the Boston and Albany road. I was on—I can't say the exact time. I have done a great deal of spare work, going out on any train that they wanted me to. I guess I was employed by the Boston and Albany corporation about a year, as near as I can recollect.

Cr.-int. 8. Did you observe anything in the results of the Springfield brakes yesterday, to lead you to change in any respect the testimony you gave in regard to this brake in this case on the 21st of September, 1872?

A. I did not see any change more than this: I saw that there had been some improvements made on car 123 since I used it. When I used the brake on car 123 before, they had these old-fashioned brake-shoes on, and the brake chains on the car were between fifteen and sixteen inches long. I noticed yesterday that they had got new patent shoes on, and that they had put on longer chains. I did not measure them, and can't say how much longer. I should say somewhere in the neighborhood of three feet in length, in all.

Cr.-int. 9. Would not this greater length of chain prevent the end of the rod to which the chain is attached being brought up so as to come against the windlass shaft when the chain was pretty slack and the windlass wheel was turned?

A. I don't think it could be brought up to the windlass shaft as it was yesterday, without breaking somewhere and staving it all to pieces.

Cr. int. 10. About how long, to your recollection, was the chain as it was when you used the Springfield brake before on this same car?

A. Between fifteen and sixteen inches.

Cr.-int. 11. How much, if you know, was the Hodge brake used on this train in going from Boston to Springfield?

A. It was not used at all, to my knowledge.

Cr.-int. 12. How much was it used between Springfield and Albany?

A. I noticed they used it at about every station.

Cr.-int. 13. In your judgment would or not the train have run by more stations than it did if the Hodge brake had not been used?

2133 A. Yes, sir; I think, under the same circumstances, and the men commenced braking as they did yesterday, if they had had car 124, with the Springfield brake on it, as I left it last July, instead of 134, with the Hodge brake on it, they would have run by a great many stations.

Cr.-int. 14. You say you are familiar with the eastern division of the road?

A. Yes, sir.

Cr.-int. 15. Were or not the Springfield brakes on this train yesterday commenced to be applied sooner in stopping at stations, than the Hodge brake is on the same division, at the same stations?

A. I think they were. I used my power and judgment yesterday, as nearly as I could, the same as I did when I ran on the train as an employee of the road last July.

Cr.-int. 16. And that was to apply the brakes sooner than if you were using the Hodge brakes?

A. In my judgment I applied the brakes to stop the train as near to the station as I could.

Cr.-int. 17. You do not exactly answer the question, whether that led you to apply the Springfield brake sooner than you would the Hodge, under the same circumstances?

A. Yes, sir; I always did commence to apply the Springfield brake sooner than the Hodge. I could always depend upon the Hodge brake, when I was on a train that had that kind of brake on it.

Cr.-int. 18. Did you feel as though you could depend upon the Springfield brake?

A. Well, I couldn't say that I did.

Cr.-int. 19. With which brake did you have to work harder in applying the brake on the whole, the Springfield brake, as it was on the trial yesterday, or the Hodge brake, as you have been in the habit of using it?

A. The Springfield brake works the hardest, and always did, ever since I had any experience.

Cr.-int. 20. And was this working harder true of it yesterday, also?

A. I did not see but it was as hard work. I could lay out all the power I had on the brake yesterday, as usual.

2134 Cr.-int. 21. You mean that it did work as hard yesterday as usual?

A. Yes; at the first of it, I think it worked a little harder, because there was no slack of the chains to speak of at all. Everything was stiff and adjusted right up. It worked very hard.

Cr.-int. 22. With which brake can you best take the slack of the train, the Hodge brake or the Springfield brake?

A. The Hodge brake. When using the Springfield brake I never had any fault found by the engineer about yanking the train, or stopping too quick; but I have been on trains, when I had a full train with the Hodge brakes, where I have had considerable growling about yanking the train and taking the slack too quick.

Cr.-int. 23. In your judgment as a brakeman, with which brake on the rear car of the train, in this trial yesterday, could you have best taken the slack of the train, the Springfield or the Hodge?

A. With the Hodge. No man of common sense would question the power of the Hodge brake against the Springfield brake. You have not got the power in the Springfield brake to apply it; you have not got the muscle. If you had a man about four times as heavy as I am, he could set the Springfield brake about as hard as I can set the Hodge brake.

Cr.-int. 24. According to your experience on this trial yesterday, as to the stops or slackness of the train, where you applied the brakes between Boston and Springfield, how well, on the whole, were you able to take the slack of the train with the Springfield brake?

A. I cannot say we took the slack of the train at all, and I can't say but what we took it every time. All the chance I had to judge of taking the slack of the train was from the car I stood on.

Cr.-int. 25. Between Boston and Springfield, how well were you able, on this trial yesterday with the Springfield brake, to keep the car you were on off of the car ahead of you?

A. As a general thing, I judge that I held it pretty well; I kept the car back, kept the slack between the cars up; but as to how much I was holding, I couldn't say.

2135 Cr.-int. 26. Were there or not several times when you noticed that the car you were on ran against the car ahead of you, when you were applying the brake?

A. I noticed that at times. I can't say whether that was owing to the brake that I was using not holding, or because there was power ahead, holding it quicker than I could.

Cr.-int. 27. When you used the Springfield brake before on the Boston and Albany road, how well were you able to take the slack of the train, or keep the car you were on from running on the car ahead of it when you applied the brake?

A. I noticed, when I was using the brake before, as a general thing I would set my brake as hard as I could, very hard, and I would think I was doing a pretty good business at the time; but some brakeman ahead would come along and say, "Well, where were you; why weren't you braking back at such and such stations?" "I was braking for dear life; why weren't you braking?" "Well," he would say, "you never took the slack away from me." I always calculated to do the best I could with it under all circumstances.

GEORGE H. GARDNER.

BOSTON, *April* 19, 1873.

WILLIAM O'BRIEN recalled.

Cross-examined by M'r Cozzens:

Cr.-int. 18. Please state whether you recollect any incident in relation to the train Thursday, going down the grade at Dalton, in reference to the effect of the Springfield brakes upon the cars; if so, please state what it was.

A. Well, in going down, before we got to Dalton, M'r Waterman came to me and told me not to touch any brake going down hill, and told the other brakemen so. When we left Dalton the slack was taken off the train, the shackles were straightened out, and when we got down a little ways the bunters came together—the draw-bars—between the smoking-car and the baggage-car. I was standing on the forward end of the smoking-car. The regular brakeman (Gardner) was standing on the hind end of the baggage-car; that was the

2136 next car to me. He made some remark about his not having the slack of the train, and about that time the slack was taken again, and they came together again, and M'r Waterman came out on the platform to me, and says he, "You are not braking up, are you?" Says I, "No, sir;" and soon after we stopped at a station—I forget now the name of the station—on the road below Dalton.

Cr.-int. 19. At this time, did M'r Sayles come through the train to where you were standing?

A. Yes, sir; M'r Sayles came through and made a remark to me; he asked me if Gardner took the slack. Says I, "No; he can't take it." That is, he asked me if he held the slack, and I made the remark in this way: says I, "Damn it, he can't hold it."

Cr.-int. 20. Hold it with what?

A. With the Springfield brake.

Cr.-int. 21. On the whole, how well do you think these Springfield brakes worked, as compared with the way they worked when you were on the train with them before?

A. In my judgment, I should not think that No. 123 worked so well as before it was fixed, because, at the time I broke on the train, it was an every-day brake, and there was no more care taken of it than there was of any brakes; but yesterday morning it was in perfect order; it had been fixed on purpose for that occasion.

Redirect:

Int. 52. Where is Dalton Station?

A. It is on the mountain, but I cannot tell where, because I am not acquainted with the road. I could not tell Dalton Station now, unless I saw the name of it on the station. They told me that was Dalton after we left the station.

Int. 53. Is it not immediately below the summit, running down from Washington to Pittsfield?

A. That is what they told me; that it was going down grade. After we left Washington, they said, "It is going down grade now," but not being acquainted with that division of the road, I cannot tell the grades.

2137 Int. 54. How many cars were between the platform where you stood and the rear of the train?

A. Three cars.

W'M O'BRIEN.

Henry Waterman recalled.

Int 1. Have you any remarks or explanations to make in reference to the evidence just give' by M'r O'Brien?

A. Where the occurrence took place was near the commencement of the heavy grades going westward over the Green Mountains. Just at that time, as I stated yesterday, M'r Taylor, having charge of the train, notified M'r Gardner to let the train run faster; and M'r Gardner also testified to that. I will state that in all the running down grade yesterday, I consulted M'r Taylor as to the speed of the train. I inquired of him several times if he let the train run that speed, if that was the speed of his train, and he said, "Yes, no more brakes necessary." (Counsel for the complainant objected to the statement of M'r Taylor.) I was controlled by M'r Taylor's judgment as to the speed of the train.

Int. 2. If I understand you, the running of the train together, as testified to by M'r O'Brien, was in consequence of the brake being let off by M'r Gardner to increase the speed.

A. That was the result of it.

Int. 3. Did Gardner thereafter take the slack of the train and hold it at an increased speed?

A. He did, below that, and held it quite hard.

Int. 4. Was there, from your observation, any difficulty in holding that train down that grade with the Springfield brake on car 123 in the rear operated by M'r Gardner?

A. The car, as I before stated, held three cars of the train on the high grades.

Int. 5. During the whole time of the passage of this train from Boston to Albany, was M'r Sayles, the complainant in this case, present, and advancing his views to M'r O'Brien and to M'r Gardner; and did he also, on returning from Albany, continue to present and press his views upon these men whenever he could get an opportunity, in your presence?

2138 A. M'r Sayles was present continually, noticed almost everything that occurred, consulted freely with me, advanced his views to me, discussed fully the merits of his brake, as an advocate, and also in the presence of both of these brakemen; and I thought very efficiently, and told him so at the time.

Int. 6. Did he, in your presence, attempt to run down the Springfield brake and set up the Tanner brake?

A. He used every disparaging epithet that could be applied to the Springfield brake, and to extol the Tanner brake.

Int. 7. And did the said Sayles, after the said O'Brien had been on the stand yesterday, have conversations with him when he left the stand in this room, and thereafter put him on the stand to be questioned?

A. I do not recollect as to the conversations.

Int. 8. Did he talk with them? I don't ask what he said.

A. I observed whispering between them.

Int. 9. And he did thereafter put him on the stand?

A. He did.

Int. 10. Since that recall, has he had the same witness in here this morning and on the stand again?

A. He has.

Cross-examined by M'r Waterman:

Cr.-int. 1. How do you know that M'r Taylor notified M'r Gardner to let the train run faster, as you testified in your first answer just now?

A. I saw him do it.

Cr.-int. 2. Where was Taylor standing, and where was Gardner standing, when Taylor so notified him?

A. Taylor was standing on the front platform of 123, looking into the door; Gardner stood at the back door, looking toward him, and he made a motion, waving his hand. I inquired what it was for, and he said it was to take off the rear brake. I went through the car immediately and inquired of M'r Gardner the condition of the brake, and he said he had it half off; M'r Taylor had signalled him to take it off.

2139 Cr.-int. 3. Where were you standing at the time that the bunters of the smoking-car, on which O'Brien was, and the bunters of the baggage-car, upon which the other brakeman was, came together?

A. Immediately after the waving that I have spoken of, near Dalton Station, I went forward, and I found that the bunters at the front end of the third car were striking against the other, and I immediately consulted M'r Taylor, if he wanted the train to go as fast as that, and he says, "Yes, we let her run here."

Cr.-int. 4. How do you know that at the time you reached the place where O'Brien was and saw the bunters together, the brake of the rear car was not being applied?

A. I was passing back and forth incessantly on that train, watching all the actions; and I ran from one end of the train to the other, making inquiries at every stage of the progress. I know it was just before going into Dalton Station that this slacking off of the brake took place; and

I also know that below Dalton Station, where M'r Gardner put on his brake hard (the point which M'r O'Brien has mentioned between the two cars), was just at the point of slackness. Just what I stated yesterday. The three cars were held by M'r Gardner's brake, the Springfield brake, on 123.

Cr.-int. 5. Will you say that at the time you stood on the platform where O'Brien stood, and saw the bunters of these two cars together, the brake of the rear car could not have been applied?

A. I was with O'Brien several times, and I make my answer, of course, taking the position stated by M'r O'Brien as near Dalton Station. I know at that time the brake was slacked on the rear car.

Cr.-int. 6. Might not the brake of the rear car have been applied between the time that you, as you say, left the rear platform of the rear car and reached the platform where O'Brien stood?

A. It might have been done, but it was entirely outside of all instructions and outside of the system of the experiment.

HENRY WATERMAN.

2140 *Deposition of Benj. C. Read, recalled.*

Examined by M'r Whipple:

Int. 1. I think you stated, in your deposition last August, that you were in the employ of the Boston and Lowell Railroad Company; are you still so employed?

A. No, sir.

Int. 2. When did your connection with said company cease?

A. The fifth of this April.

Int. 3. Please look at Defendants' Exhibit, Springfield brake, No. 2, and state whether the brake in said exhibit is the same as the one applied to four cars of the Boston and Lowell Railroad, under your direction, as superintendent of the car department of that road?

A. Yes, sir; the same.

Int. 4. You will please further state how you adjusted the long and short rods of said brakes to each other?

A. I adjusted the length of the rods by means of the turn-buckle.

Int. 5. The brake having been adjusted by means of the turn-buckles, that is, so far as connecting the rods with the truck-levers and the windlasses of the car was concerned, was any further adjustment in this respect necessary?

A. No, sir.

Int. 6. As the brake shoes wore away by use, how did you take up the wear?

A. By tightening the rods on the brake-bars and shortening the rod equally all round.

Int. 7. Then, after the brake had been adjusted properly, by means of the turn-buckles, you took up the wear by a uniform turning up of the nuts on the brake-bars, didn't you?

(Objected to, as leading.)

A. Yes; a uniform shortening of all the nuts throughout.

Int. 8. If you took up an eighth of an inch on one bar, how much did you take up on all the others?

A. We calculated to take up the same, the equivalent on the whole of them.

2141 Int. 9. Was it any more difficult to take up the wear of the brake-shoes on this Springfield brake than on any other brake?

A. Why, yes; it was more difficult, because there were twice as many nuts to take up; otherwise, there was no more difficulty.

Int. 10. That is, it required a little more time to take up the wear on the Springfield brakes than it did on any other brake? Is that it?

A. Yes, sir.

Int. 11. In what train were the four cars equipped with the Springfield brake put, and who was the conductor and who the brakeman?

A. It was known as the Lowell train; Blood was the conductor, and Emerson was one of the brakemen, and Wing the other.

Int. 12. Do you know M'r John McAllister, who was formerly in the employ of the Boston and Lowell Railroad; and if so, what were his duties while so employed?

A. He worked on general car repairs.

Int. 13. As a general rule, was it his duty to attend to the adjusting of brakes, and such other repairs as were necessary about the cars?

A. No, sir; he had nothing to do with it specially.

Int. 14. Under what circumstances was he called to perform such duty?

A. Occasionally, when one of the men was out sick, he would be sent to the car-house to take his place, perhaps for a day or half a day.

Int. 15. How came it that he was employed to look after the brakes the week that the Springfield brake was under trial in Blood's train, for the purpose of determining its capacity to stop the train on time?

A. He was not employed for that. Occasionally he was sent there to look the train over and take the brakes up, with others. Sometimes he would do it. There were three other men who occasionally did it.

Int. 16. Who did take charge of looking after the brake at that time, and at any time previous and thereafter?

2142 A. Well, that was my duty.

Int. 17. With what success did he meet in looking after the Springfield brake what time he was employed for that purpose?

A. Very poor success.

Int. 18. For what reasons?

A. He did not understand the nature of keeping it in order or altering it. He would alter one thing, right or wrong, and then he would send for me to come and regulate it.

Int. 19. To the 12th int. put to said McAllister, which read as follows: "Did you have to adjust the Springfield brakes on those four cars during that trial week, and if so, how often?" He answers, "Every time they came in; that is, every time they came over into the car-house; of course, when they came into the depot, I was not there to look after them." Did he have entire charge of this matter, as he has herein stated?

(Objected to.)

A. No, sir; I sent two other men; some days I sent three men there. There was but very little time to do anything to the train. The train was in the house some mornings not more than twenty minutes.

Int. 20. He has stated, in answer to the 15th int., which is as follows, "How often do you say he has adjusted them," (that is, the Springfield brakes), that he adjusted them "once a day?" Was that necessary?

A. Well, we looked them over every day, whether it was necessary or not. We endeavored to keep them in good order.

Int. 21. Were you in the habit of looking over the cars having the Hodge brake on every day?

A. They are all looked over every day, every trip they come into the house, to see that the brakes are proper and correct.

Int. 22. Are you under the necessity of taking up the wear of brakes every day?

A. No; it don't require it every day on any brakes; no faster than the iron wears away on the shoe.

Int. 23. To the 17th direct int., which reads as follows: "About
2143 how much time did you sometimes have to spend during this trial-week
adjusting these Springfield brakes?" He answers, "Well, if I knew how long that train was in, I could tell; for some days, almost every day during that week, I was out there from the time they came in until they went out." Then int. 18 was put, "You were at work adjusting all the time"? His answer is, "Yes, sir." What have you to say to this answer?

(Complainant's counsel objects to this species of questioning as improper.)

A. Well, the train arrived in Boston at five minutes past eight; it waited for another train to get out of the way, and then came over to Cambridge. It generally arrived there from twenty to thirty minutes past eight; and then the train stood from fifteen to twenty minutes, was hauled out of the house again, to shift another car into the train, and left the car-house from ten to twenty minutes past nine. That would make less than one hour that the train stayed in the house, including hauling it in the time.

Int. 24. Int. 20 reads as follows: "Did you have anybody helping you adjust these Springfield brakes during this time"? He answers, "Yes, sir." Int. 21 reads as follows, "Did you, when, as you have stated, you were adjusting those brakes all the time from the time the train came in until it went out, always get the adjustment finished?" Answer, "No, sir." Please state whether, as would appear by this evidence, all the men, including McAllister, were engaged in adjusting these brakes, and failed to do it even then?

A. They were employed all the time the train was in the house, and for the lack of judgment to adjust them, they could not do it.

Int. 25. Who did do it?

A. I very often had to go and do it myself. By spending five minutes, I would adjust the whole of it.

Int. 26. To the 30th direct int., which reads as follows: "Now suppose that all the cars belonging to the Boston and Lowell Railroad, which run on passenger trains, were equipped with the Springfield brake, how many men do you think it would take to adjust those brakes properly?" His answer is, "I should think it would take about fifteen or twenty." What is your judgment on that point?

2144 A. I should consider that was a wrong opinion. Three men
would do all the work and take care of the trains as well as they would with the Hodge brake. They would have to adjust it oftener.

Int. 27. The 31st int. read as follows: "How many men are there now employed on the Boston and Lowell Railroad, inspecting and looking after the cars and adjusting the brakes?" The answer is, "We have only got three men, I believe, in the car-house to look after the whole of the cars and adjust the brakes." That is correct, is it?

A. Partially correct.

Int. 28. Wherein it is not, please make the necessary correction?

A. Well, there were other duties that they performed, shifting trains, shifting wheels under the cars, and doing general repairs. It is about the labor of two men to look the train over. Some days there would be more work than ten men would do; other days, one man would do all the repairs; but two men generally looked the train over.

Int. 29. In his answer to the 31st int., he says: "They don't have to touch one of these other brakes once in a dog's age, without it is to put on a brake-shoe." He is then asked, "What brake do you refer to when you say 'these other brakes?'" His answer is, "The Hodge brake." Is that so?

A. That needs less care than any other brake there is running. It takes care of itself better than any other.

Int. 30. The 44th int. reads as follows: "In your opinion, as a railroad man, how would the Springfield brake answer for cars that have to run as far as the sleeping cars do, namely, from Boston to Montreal"? Ans. "I don't think they would answer very well." Int. 45. "Why not?" Ans. "Because, by the time they had run up there and back again they would have got pretty well shaken to pieces. I should not think there would be much of them left, the way those worked." Is there in the Springfield brake any more liability to be shaken to pieces than any other brake, if the nuts are all properly tightened up?

(Objected to.)

2145 A. If it is put on properly, as it should be, and as it is in the model, and the nuts well screwed up, it would run as long as any other brake with the nuts in the same condition. There is nothing in the operation or the wear of the brake that would loosen the nuts any quicker than on the Hodge brake.

Int. 31. The 46th int. reads as follows: "To what do you refer when you say, "the way those worked"? Ans. "The Springfield brake that was on Blood's train, for sometimes when they got in, the bolts on the connecting rod from one brake to another would be worked loose and be half-way out, almost all of them, sometimes." Was that so?

A. He had reference to the check-nuts on the turn-buckles. It was immaterial whether they worked loose back or forth. The turn-buckle would not turn more than one or two turns in going from Boston to Lowell and back.

Int. 32. Then he did not refer to the nuts on the brake-bars?

(Objected to.)

A. I don't think he did.

M'r. COZZENS. You don't know anything about what he refers to, do you?

WITNESS. No; I don't. On one particular occasion, I know he referred to those nuts.

Int. 33. The 47th int. reads as follows: "Did you ever have any difficulty with those Springfield brakes on Blood's train in adjusting them so that they would operate equally?" Ans. "Yes, sir; I couldn't do it." Did you find this to be the fact, in your own experience?

A. It is no more difficult to adjust those to operate well than any other brake.

Int. 34. Did you find out that he could not do it?

A. Yes, sir; he hadn't brains enough to operate them properly, most of the time.

Int. 35. What were his personal habits, which might affect his brain?

A. That question would affect his character.

Int. 36. In other words, was he given to strong drink?

A. That was the cause of his being discharged; his intemperate habits.

Int. 37. To what extent was he addicted to intemperance?

A. A large portion of the time he was partially intoxicated, particularly when he had any money to get it with.

2146 Int. 38. Had he been in the employ of the company previous to the time when he gave this evidence?

A. I employed him about three years ago, and he was so intemperate that he did not feel on an equality with the other men in the shop, and he left, and was gone perhaps a year; then he came back, and I hired him again. This last time he worked probably a year and a half up to last December. He was discharged last December for intemperance and neglect of his work, brought on through intemperance.

Int. 39. He says, in answer to the 48th int., "Say one brake hung off from the wheels two inches, and the other half an inch or an inch—when I tried to bring up the one farthest off as near up as the other one was, I would bring the one that was nighest close up, and the other one would not be up close enough." Was there any time when the shoes stood off two inches from the wheels?

A. I should think not. There was no necessity for it. If he could see what he was about, he could adjust them equally to the wheels.

Int. 40. Int. 49 is, "How often did you have such a difficulty as this?" Ans. "Well, as often as I had a mind to go to work at it to do it." Did this difficulty grow out of his want of understanding the proper way of adjusting the brake, or was it in the brake itself?

A. It was in the want of his understanding the proper means of arranging it and adjusting it.

Cross-examined by M'r Cozzens:

Cr.-int. 1. Is your recollection perfectly distinct of all the circumstances attending keeping the cars which had the Springfield brake in order during this trial week on the Boston and Lowell Railroad?

A. It might not be, on all the circumstances.

Cr.-int. 2. How much of the time during that week did you yourself do anything about adjusting the Springfield brakes on those cars?

A. Perhaps I might have gone up there every day. It was my business to go through the car-house and see that the work went right and properly. I might have gone there every day.

2147 Cr.-int. 3. The question is not what you might have done, but what you did?

A. I would say that I did go through the car-house every day. My place was at the lower end of the shops.

Cr.-int. 4. How much did you do, during that week, towards adjusting the cars that had the Springfield brake on them?

A. I directed the work.

Cr.-int. 5. How much time did you spend in that?

A. It might not have been much time, because the train was not there but very little of the time. It might have been ten or fifteen minutes every time I was there.

Cr.-int. 6. How often during that week were you there ten or fifteen minutes at a time?

A. Well, nearly every day.

Cr.-int. 7. What part of the day was it?

A. It was from half-past 8 to 9 o'clock—some time intervening. Sometimes the train was in at half-past 8, and then it would not be in until a few minutes before 9. It was very uncertain what time that train got into the house. We could not do anything to it until it got into the house.

Cr.-int. 8. Were you there at any other times of the day when that train came in, except about half-past 8 or 9?

A. There was no other time it was there except that time. It did not come over to Cambridge except in the morning.

Cr.-int. 9. How many days of this week will you swear that you were in that car-house, directing the adjustment of the brakes on those Springfield-brake cars ten or fifteen minutes at a time?

A. I could swear I was there five days. That would except Monday.

Cr.-int. 10. You mean you were there every day in the week, except Monday, ten or fifteen minutes, directing the adjustment of the brakes on those Springfield-brake cars?

A. I think I was.

Cr.-int. 11. Will you swear to that?

A. So far as my recollection will extend, I could swear to it.

Cr.-int. 12. How clear is your recollection about it?

A. Well, as clear as it was a part of my duty, and if I performed my duty I was there.

2148 Cr.-int. 13. You mean, then, do you, that the reason why you think you were there these five days was because it was your duty to be there?

A. Yes, sir.

Cr.-int. 14. You do not positively recollect being there?

A. I do some days recollect positively being there.

Cr.-int. 15. How many days of that week do you positively recollect being there, that you are now willing to swear to?

A. As I said before, I should be willing to swear I was there five days.

Cr.-int. 16. Will you swear that you were there five days, as a matter of positive recollection, without any reference to its being your duty to be there?

A. I couldn't swear to that.

Cr.-int. 17. How many days will you swear you were there during that week?

A. Five days, I told you before, as far as my recollection would go.

Cr.-int. 18. I again ask, then, will you swear that it is a matter of positive recollection now, that you were there five days during that week?

A. With the same proviso to it, I do.

Cr.-int. 19. What is the proviso you mean?

A. To the best of my recollection.

Cr.-int. 20. Then you mean that you cannot swear positively, do you?

A. I said before, I could not swear positively.

Cr.-int. 21. During the days you were there during that week, will you swear that you stayed ten or fifteen minutes at a time, directing the adjustment of those Springfield brakes?

A. Yes, sir; I could do that.

Cr.-int. 22. It took you, did it, the whole of the time that you spent in the car-house during these days of this week to superintend the adjustment of the Springfield brakes on those cars?

A. No, sir; it did not.

2149 Cr.-int. 23. How, then, is it that you just stated that you spent ten or fifteen minutes a day, during these days, in the car-house, in superintending the adjustment of the Springfield brakes?

A. The labor of fixing the brakes might occupy the fifteen minutes. I would tell a man what to do, and I would move somewhere else and see to something else, and before I got back again that would consume the fifteen minutes.

Cr.-int. 24. Then you mean you did not stay there ten or fifteen minutes directing the adjustment of the Springfield brakes?

A. I mean that I directed the work there the same as I did the whole business of the shop. It did not require my eye on it all the time to direct it.

Cr.-int. 25. So that your eye was not on it during ten or fifteen minutes on any day?

A. No, sir; it was not necessary.

Cr.-int. 26. Why was it not necessary?

A. Because it took perhaps two seconds to tell a man what to do, and it took him ten minutes to do it.

Cr.-int. 27. What was it that it would take you two seconds to tell a man to do, and take him ten minutes to do it?

A. To shorten up that rod; to shorten up another one; to loosen up another one. I would give the directions, and go and see that it was done.

Cr.-int. 28. While you were away, after you had given the directions, of course you do not know anything about what the men did, do you?

A. No further than I went to see what was done when I came back, and if it was not done properly I would tell them to alter it.

Cr.-int. 29. How many men were there in that car-house attending to the adjustment of the Springfield brake during this week to whom you gave any such directions as you have stated?

A. There were three men to whom I gave directions to see to those Springfield brakes. There was Copperthorn, Hillock, and McAllister.

Cr.-int. 30. Why was McAllister employed as one of those three men to do that work?

A. He was not employed, as a general thing. When the other men were engaged at other work I sent him.

2150 Cr.-int. 31. Haven't you just said that three men were employed during that week to adjust the Springfield brakes, of whom McAllister was one?

A. Yes, sir; but not all at one time.

Cr.-int. 32. How much time was each one of them employed?

A. Some days I would send only one man up there; he would do what was necessary, and come back again before the train went out; he might not be gone more than fifteen minutes. As a general thing, they occupied all the time that the train remained there; whether they had work to do or not, they would use up that amount of time before they came back to the shop.

Cr.-int. 33. What would they be doing to occupy the whole fifteen minutes, if there was no work to be done about the train?

A. Stand around and loaf, as workmen generally do when the eye of the superintendent is off of them.

Cr.-int. 34. How much time during this week was McAllister there, attending to those Springfield brakes?

A. He was there no definite time, only when he was sent.

Cr.-int. 35. That is evading the question. Please answer how much he was there, or how much he was sent; just which way you choose to look at it. If he was there when he was sent, he was there. How much time was he there? That is what I want to know.

A. I will put it at forty minutes. That is about the time the train remained in the house. He would stay as long as it was possible to have an excuse for staying.

Cr.-int. 36. How do you know what his motive for staying was?

A. He was a man who was termed a general loafer in the shop. That was his character in the shop—a general loafer. If you are going into his personal character, I can give it; but that I don't think has anything to do with the case.

Cr.-int. 37. Have you any personal knowledge that during that week McAllister remained in that car-house any longer than was necessary to attend to those cars? Answer only what you know personally.

2151 A. I couldn't say that, because it was not fixed upon my mind. It was done as the general routine of work.

Cr.-int. 38. How many days in that week was McAllister there forty minutes a day, attending to those Springfield brakes?

A. I will say six days, and let it go, forty minutes a day.

Cr.-int. 39. How many of those six days did you send any other man there during the forty minutes that the train was in the car-house, to attend to those Springfield brakes?

A. I can't say. I sent them when in my judgment I thought it required more than one man to do the work. There were so few minutes to do the work that if I thought one man couldn't do it I sent two, and then I would go myself to see that it was done.

Cr.-int. 40. What is your best recollection of the number of times you sent any other man besides McAllister to aid in adjusting those Springfield brakes?

A. I cannot answer that with any certainty.

Cr.-int. 41. Did you send another man once during that week?

A. Certainly once.

Cr.-int. 42. Did you send another man twice?

A. I could say twice, and might be every day. The object was to make these brakes work as well as they would.

Cr.-int. 43. Why did you want to make those brakes work as well as they would that week?

A. To get as good a record of them as we could. The brake was a poor brake, we knew, and we wanted to get as good a record of the operation of it as we could.

Cr.-int. 44. Did you know at the time what was going to be done with the record of it that you speak of, after that week's trial was over?

A. Not from any positive knowledge.

Cr.-int. 45. Before that week's trial commenced were you told by any person anything which led you to understand that it was of any importance that that brake should be made to work as well as it would during that week?

A. Not particularly on that week; I had no personal knowledge that the trial was to be made.

2152 Cr.-int. 46. Why was it, if you had no personal knowledge that the trial was to be made that week, were you so particular to see that the brake was made during that week to work as well as it could?

A. Well, the understanding was that the brake was to be taken off, and they wanted the brake to be put and kept in good order for a week, and run it, to get a good record of it. That was the reason I had, as far as I understood it.

Cr.-int. 47. What was the understanding which you had as to what use was to be made of this record after this week of trial was over?

A. Well, from any knowledge outside of my own impressions, I do not know anything about what use was to be made of it.

Cr.-int. 48. What were your impressions about it?

A. That it was to be used as evidence in this lawsuit.

Cr.-int. 49. Were your impressions about that brake such that you were led to exercise special care, as you have stated just now, to keep it in such order that it would work as well as it could during that week?

A. Yes, sir; that was the object.

Cr.-int. 50. You tried to accomplish that object, did you, during that week?

A. We tried to make it do as well as the brake was capable of doing.

Cr.-int. 51. So far as you know, did all of those men who took part in adjusting the brake during that week try as hard as they could to so adjust it as to make it work as well as it possibly could?

A. No further than men all try to do their work satisfactorily. They knew nothing about the cause of the special care to be used.

Cr.-int. 52. But they knew, didn't they, that there was something going on that week, whether they knew what it was or not?

A. They knew there was competition between that brake and another brake for superiority in working. They knew nothing about the lawsuit.

2153 Cr.-int. 53. But they knew, didn't they, that there was a special reason why that brake must be made to work as well as it could during that week?

A. Yes, sir; I gave them orders that it was necessary to keep the brake in as good order as we could, to make it operate suitably.

Cr.-int. 54. During that week?

A. During that week.

Cr.-int. 55. How long does it take you, ordinarily, to adjust the Hodge brakes on a car?

A. About ten minutes.

Cr.-int. 56. How many men do you ordinarily send out for the purpose of adjusting the brakes on one car?

A. I don't send out any to do it.

Cr. int. 57. Does itself, does it?

A. When the brakes are put on they are put on properly, and as the shoe wears they shorten the connecting-rod between the two bars; that is all it requires unless something breaks.

Cr.-int. 58. How many minutes does it take to shorten those connecting-rods on one car?

A. About five minutes, generally speaking. A man might work an hour to get off a bad-working nut.

Cr.-int. 59. My question was, of course, generally speaking, and you answer that, five minutes, do you?

A. Yes, sir.

Cr.-int. 60. How many men did you send to adjust the Hodge brake on one car?

A. None at all.

Cr.-int. 61. How did it get adjusted, then, if you sent nobody to do it?

A. When the brakes were put on they were put on properly, and as the shoes wore out the man in the car-house who looked over the cars tightened up the nut on the rod, as the shoes wore. That is all the adjusting they got.

Cr.-int. 62. How many of those men now referred to did it take to make this adjustment of one Hodge car?

A. It would take one man five minutes, if it needed adjusting.

Cr.-int. 63. How many cars do you say had the Springfield brake on upon the Lowell road during that trial week?

A. Four.

2154 Cr.-int. 64. Do you know anything about the working of that brake in its use out on the road during that trial week?

A. No more than hearsay. I went over the road once with it, and it made the stops then within a very few seconds of the time that the best working of the Hodge brake would make.

Cr.-int. 65. That is all you know about it?

A. I only went over the road with it once, for the purpose of seeing the operation of it.

Cr.-int. 66. With the Hodge brake, are you in the habit of going into the car-house to direct the men what to do to adjust it?

A. It don't require any adjusting, as I say; after it is once properly fixed it wears the shoes out, and when new shoes are put on, it requires the lengthening of the rod again. (Question repeated.) No, sir.

Cr.-int. 67. Was McAllister's trade that of a car-builder?

A. No; his trade, I think, is a millwright.

Cr.-int. 68. He was a mechanic by trade, was he?

A. An indifferent mechanic.

Cr.-int. 69. So far as you know, how long had he been engaged in working upon cars?

A. Not to exceed three years, to my personal knowledge.

Cr.-int. 70. Did that working upon car include putting brakes upon them, and seeing that the brakes were in order?

A. No, sir.

Cr.-int. 71. What did it include?

A. It included jacking up cars, taking out trucks, shifting wheels into the trucks, and renewing parts of the trucks.

Cr.-int. 72. Do you think a man who did that work for three years would not be able to tell when a brake was in order, and what needed to be done to it to keep it in order?

A. I don't think he could.

Cr.-int. 73. Why, then, did you send him to do this work of adjusting the Springfield brake during this week, if it was so important as you have stated that the work should be done just right?

A. I don't think I sent him many days to do it. When it was
2155 not convenient to send another man he was sent, but I did not
rely upon him to do it. M'r Copperthorn and Hillock were the two men that I relied upon to fix the brake. They put it on to the cars and they understood more about it.

Cr.-int. 74. It took at least two men to keep these Springfield brakes adjusted during that week?

A. No, sir; not necessarily.

Cr.-int. 75. If it did not necessarily take two men to keep them adjusted that week, why did you have three men employed during that week to do it?

A. I did not have three men at one time. Some days it would be one man, and some days it would be another man.

Cr.-int. 76. Haven't you stated that McAllister worked at the adjustment of that brake every day during that week, and that you had two other men in addition helping him?

A. Not positively. You have confounded my statements together. The three men were employed during that week to keep these brakes in order. Some days one man would go, and some days another would go, and some days two of them would go. Some days it included McAllister, and other days it did not. Therefore, I cannot say positively how many days McAllister was there, or how many days another man was there.

Cr.-int. 77. You cannot swear, can you, that McAllister was not there every one of the six days of that week?

A. No, sir; I say I can't swear there was one or the other of them there.

Cr.-int. 78. You cannot swear that at least one of the other two men was not there also every one of the six days of that week?

A. No, sir; I could not do that.

Cr.-int. 79. Can you swear that the third man was not there also every one of the six days of that week?

A. I could swear that the third man was not there. You know it is very difficult to get at a point, where you are superintending general work. The statements I make I can substantiate as far as I go. I don't want to go any further than I can substantiate.

Cr.-int. 80. Then you really think, do you, that McAllister did not know how to adjust a car-brake during that week?

2156 A. Not to my standard of knowledge.

Cr.-int. 81. Do you think he could have adjusted the Hodge brake during that week?

A. The Hodge brake does not require any adjusting.

Cr.-int. 82. Does the Hodge brake never require to have the nuts on the brake bars taken up?

A. Only when you put on new shoes.

Cr.-int. 83. Do you think that McAllister during that week would have been able to take up the nuts on the brake-bars of the Hodge brake?

A. Possibly he might, and possibly not. Sometimes he was in such a condition that he did not know whether he stood on his head or his feet. Not often so when he was sent to the car-house.

Cr.-int. 84. You think that during that week, when you thought it was very important to have that brake adjusted so that it would do its very best, you sent an intoxicated man to do the work?

A. I looked out and saw that he was not intoxicated, when I sent him there.

Cr.-int. 85. Then do you think that during those parts of the week when you looked out and saw that he was not intoxicated, and therefore sent him to do the work, that if he had been engaged in taking up the nuts of the Hodge brake, he could have done it?

A. Probably he could.

Cr.-int. 86. Have you not stated in your direct examination that it is no more to take up the nuts on the Springfield brake than it is on the Hodge brake?

A. It requires no more skill, after it is once adjusted properly.

Cr.-int. 87. Then you think if McAllister had not been intoxicated he could have taken up the nuts on the Springfield brakes that week?

A. Yes; if he tried to do it properly. I should think any man ought to do it after he is told what to do.

Cr.-int. 88. Then, on the whole, you think McAllister could have done the work of adjusting the Springfield brakes that week, if he was not intoxicated when he did it?

2157 A. If he did as he was told, I think he could have done it.

Cr.-int. 89. Have you not already stated that the men who worked at adjusting the Springfield brakes tried hard to obey your orders, and do as they were told?

A. Yes; I suppose they did.

Cr.-int. 90. Have you any reason to doubt that they did?

A. I have no personal knowledge that they did try.

Cr.-int. 91. That is not the question. Have you any reason to doubt that they tried to obey your orders?

A. No; I have no reason to doubt that they tried to obey orders.

Cr.-int. 92. You have already stated, have you not, that you did not send McAllister to do that work at any time during that week when he was intoxicated?

A. I could not swear to that. My impression is, that I would not send an intoxicated man to do any work in the car-house. (Question repeated.) Yes.

Cr.-int. 93. Then you think, don't you, that you did not send him when he was intoxicated; and, if he was not intoxicated, he could have done the work properly on those brakes; that, as the fact was, he did do the work properly?

A. If he did it as he was told to do it, he did it properly.

Cr.-int. 94. Have you any reason to doubt that he did do as he was told to do?

A. I have reason to doubt that he did it as he was told to.

Cr.-int. 95. What reason have you?

A. His own statements, under oath.

Cr.-int. 96. Mention his statements under oath which lead you to doubt it.

A. Why, in regard to one shoe being off an inch and a half, and the other half an inch; and his not knowing whether to turn one nut or another nut to regulate it.

Cr.-int. 97. Where has he said that he did not know whether he was to turn one nut or another to regulate it?

A. Perhaps he did not, in those precise words; but he said he did not know what to do, and he would send for me to come up and direct him.

Cr.-int. 98. If you directed him what to do, he would know what to do, would'nt he?

2158 A. Yes, sir; if he was in a suitable condition of mind to know anything.

Cr.-int. 99. You have already said, have you not, that you did not send him during that week when he was not in a suitable condition of mind?

A. Yes; that is the statement.

Cr.-int. 100. Have you any personal knowledge that the Springfield brake or brakes which McAllister during that week adjusted were not in the condition which he has testified they were?

A. I know he would fix them to the best of his ability, and they were not satisfactory, and he would send for me to come and regulate them. (Question repeated.) Yes; I know they were not in that condition, after they were adjusted. They might have been in that condition when they came into the house if the rods were broken.

Redirect:

Int. 41. You spoke of the Springfield brake being a poor brake. With what other brake did you compare it?

(Objected to.)

A. That was comparing it to the Hodge brake.

Int. 42. Then, if I understand you, as compared with the Hodge brake, the Springfield brake might be regarded in the light of a poor brake?

A. Yes, sir.

Int. 43. How would you regard it if there were no such brake as the Hodge brake in existence?

A. As far as my knowledge goes, it is equal to the other brakes in use.

Int. 44. How does it compare with the so-called Tanner brake?

A. Well, it is as good as that. There would be the same trouble with the Tanner brake as with the Springfield brake.

Int. 45. You will please look at "Defendants' Exhibit Nichols-Tanner brake," and state whether that is what you regard as the Tanner brake.

A. That is what we put on as the Tanner brake, with the exception of altering the leverage on that centre lever, giving it a little power.

2159 Int. 46. So far as your knowledge goes, in applying the Tanner brake, did you invariably connect the two rods at the end of the lever?

A. Not always. We set one rod in from seven to nine inches.

Int. 47. Is it usual to connect either way—either at the ends of the lever, or set it in?

A. We connected it both ways in the trial we made of it.

Int. 48. What is necessary in taking up the wear on the Tanner brake?

A. Take it up on the rods, the same as the other.

Int. 49. Must it be taken up uniformly, or does it not make any difference?

A. It must be taken up equally all around, to keep the length of the rods equal, the same as the Springfield brake, to have it operate.

Int. 50. How would the Hodge brake be affected, should you take up the wear on one truck and take none up on the other truck?

A. It would equalize itself, if there was room enough on the rod to wind up the slack.

Int. 51. Would the Tanner brake equalize itself under such a state of things?

A. No, sir.

Recross:

Cr.-int. 101. How much have you ever used the Tanner brake?

A. I have put it on twice. We had two spells of experimenting with it, the date I can't distinctly say; about, say, four years ago. The first trial it was put on and run a short time and then taken off; I can't state distinctly how long we used it, but a very short time; it did not exceed three weeks. Then we put it on and run it in competition with the Springfield brake last summer.

Cr.-int. 102. How long?

A. We ran it perhaps six weeks.

Cr.-int. 103. Those three weeks and six weeks are all you have ever seen of the Tanner brake?

A. All the use I have had of the Tanner brake.

2160 Cr.-int. 104. How many cars was it on at either of those periods?

A. One only at each period. It was first put on to one car and run in competition with this Springfield brake last summer, and the brakemen liked the Springfield brake best, as they recognized it—the brake with two chains—and we took the other one off, and altered it to the Springfield brake.

Cr.-int. 105. Do you know why the Tanner brake was put on at that time and run in competition with the Springfield brake?

A. No, sir.

Cr.-int. 106. Was anything said to you by anybody about it?

A. No further than to give me orders to put it on.

Cr.-int. 107. Did you know anything about this lawsuit at that time?

A. Yes, sir.

Cr.-int. 108. Do you know whether the brakemen knew about the lawsuit at that time?

A. I think they did not, by their questions to me.

Cr.-int. 109. Who were those brakemen?

A. Wing was one of them.

Cr.-int. 110. And Emerson the other?

A. Emerson, I think, was not on the train at that time.

Cr.-int. 111. Who was the other one?

A. I could not state his name.

Cr.-int. 112. How was the Tanner brake arranged at the time it was used on the Lowell road, in competition with the Springfield brake?

A. Arranged with the fixed lever in the centre; arranged like the model "Defendants' Exhibit Nichols-Tanner brake."

Cr.-int. 113. In all respects like that model?

A. Yes, sir. First we connected the rods in a straight line at the end of the lever; afterwards we carried one rod in nine inches, to give it a leverage on each side the two opposite rods.

Cr.-int. 114. How was the Tanner brake, at the time you say you saw it there about three weeks, about four years ago?

A. It was arranged in the same way as the model referred to, except that the rods were carried in seven or nine inches.

2161 Cr.-int. 115. Were the truck-levers on each of those occasions, four years ago and last summer, arranged as they are in "Defendants' Exhibit Nichols-Tanner brake"?

A. Yes; just the same.

Cr.-int. 116. You never saw the Tanner brake used as the regular brake on a railroad, did you?

A. No, sir.

Cr.-int. 117. You have no knowledge, then, about how it operates under such circumstances, have you?

A. No, sir.

Cr.-int. 118. Then, when you say in your redirect examination that you meant the Springfield brake was a poor brake as compared with the Hodge, or that it is equal to the other brakes in use, what other brakes in use did you refer to?

A. The Tanner and the Stevens; that is all I have any knowledge of.

Cr.-int. 119. Do you think the Springfield brake is as good a brake as the Stevens brake?

A. I have not had experience enough with the Stevens brake to form an opinion.

Cr.-int. 120. Why, then, did you say that you thought the Springfield brake was as good a brake as the Stevens, if you had had no experience with that?

A. Because they both answered the purpose of stopping the train.

Cr.-int. 121. Do you think the Springfield brake will answer as good a purpose in stopping a train as the Stevens brake?

A. Yes, sir.

Cr.-int. 122. You fell positive of this, do you?

A. Yes, sir.

Cr.-int. 123. Would you, as a master car-builder, be as willing to use the Springfield brake upon all the passenger cars of a railroad as the Stevens brake?

A. I don't know but what I would.

Cr.-int. 124. Can't you make your answer any more definite than that? Would you? That is the question.

A. No; not unless I had the experience to form a better opinion.

2162 Cr. int. 125. Why, then, if you have not had experience enough to form a better opinion, do you say that the Stevens brake is as good as the Springfield brake?

A. That is my impression, because they both answer the purpose of stopping trains.

Cr. int. 126. Do you know any difference between them in respect of stopping trains?

A. No, sir.

Cr. int. 127. If a brake upon a passenger train, when experienced brakemen do the best they can with it, lets a train run by stations, do you consider that to be as good a brake as a brake which, under the same circumstances, does not produce that effect?

A. No, sir; it is not as good a brake; is not in as good condition. It don't necessarily condemn a brake if the brakemen let the train go by a station. Sometimes the best brake does that.

Cr. int. 128. Suppose a brake in its regular use, kept in as good condition as is common upon first-class railroads, and in the hands of experienced brakemen, permits passenger trains to frequently run by stations, do you consider that as good a brake as a brake which does not do that?

A. If there was equal care used by the brakemen to stop the train in both cases, I should consider that the poorer brake of the two that let the train go by. Ordinarily, it all depends upon the brakemen whether a train runs by or not.

Cr. int. 129. Take the same brakemen, on the same train under the same circumstances, and doing in each case as well as they can, and the brakes being respectively in the condition in which they are ordinarily kept upon first-class railroads, on passenger trains, would you or not consider that a brake which frequently allowed such a train to run by stations to be as good as a brake which did not do that?

A. I cannot answer that positively, because there are so many provisos to it. It is owing to the skill of the brakemen. (Question repeated.) The brake that allowed the train to run by the stations would evidently be the inferior brake at that time; it would not follow it was an inferior brake at all times.

2163 Cr. int. 130. Suppose that, taking one month with another, a brake kept in as good order as brakes are usually kept upon first-class railroads, would let a passenger train run by stations, in the hands of experienced brakemen, who were operating the brake as well as they could, would you or not consider such a brake as good a one as another brake, on the same train, under the same circumstances precisely, which did not permit the train to run by?

A. I should think the brake that held the train at the stations was the best brake.

Cr. int. 131. Would you, as a practical railroad man, use a brake upon your road, which, under the circumstances named in the last question, would permit passenger trains to run by stations, if the choice was left with you?

A. Not if there was one that evidently held them at the stations. I would use the best brake.

Cr. int. 132. In your answers in this deposition to-day in reference to any comparison between the Springfield brake and the Tanner, have you had any other experience with the Tanner to go by than the experience you have referred to here as continuing over about three weeks, four years ago, and about six weeks last summer?

A. No, sir.

BENJ. C. READ.

Deposition of Edward Lang, recalled.

Int. 1. Are you the Edward Lang who testified for the complainant in this case, September 24, 1872?

A. I am.

Int. 2. Please look at "Defendants' Exhibit, Springfield brake No. 2," and state whether the brake thereon represented is the same as the brake applied to passenger cars No. 12 and No. 40, on the Boston and Providence R. R. and used thereon from February, 1872, to November of the same year.

A. Yes, sir.

Int. 3. Look at "Defendants' Exhibit, Nichols-Tanner brake,"
2164 and state whether the brake theron represented is the same as the one applied to car No. 10, on the Boston and Providence road, and used thereon for the time above stated.

A. Not exactly the same. I think the rod from the centre-lever to the truck-lever was put in ten inches from the outer end of the centre-lever.

Int. 4. Were the truck-levers arranged the same on said car No. 10 as seen in the model?

A. Yes, sir.

Int. 5. The size of windlass and size of shaft on which the chain winds the same?

A. The same; 16-inch wheel and inch and a half barrel.

Int. 6. How is the wear of the brake shoes taken up on both these exhibits?

A. By nuts going through the brake beam.

Int. 7. Is it necessary that there should be an accurate adjustment in both exhibits to get the best results?

A. Yes, sir.

Int. 8. Supposing you should take up the wear of the shoes on one truck and not on the other, in one or both of these exhibits, what would be the effect on the operation of the brake?

A. Well, it would brake harder on one truck than on the other.

Int. 9. Then, in that respect, what is true of the Springfield brake is also true of the Tanner brake?

A. Yes, sir; I should say so.

Int. 10. Was there or not any complaint made to you about the brakes on cars Nos. 10, 12, and 40, by any one before G. F. Lincoln and H. M. Rogers went to Springfield to testify in this case?

A. Not that I remember in particular.

Int. 11. What was the nature of that complaint if any, after their return?

A. Well, they did not like the brakes so well as they did their old ones.

Int. 12. What do you mean by "old ones"?

A. I mean the Hodge brake.

Int. 13. Why were not the brakes taken off from cars Nos. 10, 12, and 40, on the request of M'r Rogers?

2165 A. Because the superintendent gave no orders to have them taken off.

Int. 14. And you were therefore obliged to run them until such time as he did give the order?

A. Yes, sir.

Int. 15. About how long was it after they returned from Springfield that you received the order from the superintendent to remove the brakes from the aforesaid three cars?

A. Well it might have been as long as two months; it might not have been more than six weeks; I can't tell exactly.

Int. 16. Then, from the time the brakes were put on said three cars, in February to August, there was no special complaint came to you with regard to the working of the same, as I understand you?

A. No, sir.

Int. 17. And when the complaint did come to you, after the return of the aforesaid men from Springfield, it was for the purpose of getting on what they regarded as a better brake; the old Hodge brake?

(Objected to as leading.)

A. Yes, sir.

Int. 18. You will again look at "Defendant's Exhibit, Nichols-Tanner brake," and state at how early a time said brake was in use on cars of the Boston and Providence Railroad.

A. 1847.

Int. 19. What month in 1847?

A. I commenced work the 19th day of October for the Boston and Providence Railroad.

Int. 20. Is there any doubt in your mind as to the correctness of your answer, to wit: that said brake was in use on that road in October, 1847?

A. No, sir.

EDWARD LANG.

BOSTON, *April* 21.

Deposition of Benjamin Ray, recalled.

Int. 1. Were you examined in this case at Springfield, Mass., July 31, 1872?

A. Yes, sir.

2166 Int. 2. Please look at "Defendant's Exhibit, Springfield brake, No. 1," and state whether the brake thereon correctly represents the Springfield brake as applied to cars 123 and 124 of the Boston and Albany road?

A. I should say it did, exactly the same.

Int. 3. Marcus L. Braman, who was brakeman for a time on William Jennings' train, on which the Springfield brake No. 1 was used, has stated, in answer to the ninth direct interrogatory, which reads as follows: "How did those Springfield brakes work, as to holding the train?" "Worked very poorly." "Int. 10. State what difficulty you found with them while you braked on them?" "Ans. The most difficulty I found, I couldn't hold the train with them. They didn't work; didn't do the work." And in answer to the thirteenth direct interrogatory, he says: "You couldn't discover that there was any brake on the car at all; couldn't discover that it held the car a mite." Were you in the habit of making inquiries of said Braman in relation to the working of this brake? And if so, state what answers he made to you.

(Objected to as being incompetent for the purpose of contradicting Braman.)

A. I used to ask him when they came in, and he said they worked as well as he wanted any brake to work. That is just the answer he gave me.

(Answer objected to.)

Int. 4. Was there applied to car 123 of the Boston and Albany Railroad what is called the Tanner or centre-lever brake, and run in connection with the Springfield brake?

A. Yes, sir.

Int. 5. Please look at "Defendant's Exhibit, Nichols-Tanner brake," and state whether the brake thereon correctly represents the said Tanner brake, as applied to a car of the Boston and Albany road?

A. I should say it did represent it.

Int. 6. Please look at the centre lever on the body of the car, and state whether it was arranged on said car at the same angle that it is in the model.

A. I should say it was.

Int. 7. At what angle, as near as you can judge, was it arranged?

A. They usually put them at an angle of forty-five degrees.

2167 Int. 8. Then it was not set at about a right angle to the body of the car?

A. No, sir; not on the car that I saw—123.

Int. 9. In answer to the twenty-first interrogatory, which is as follows: "Have you any knowledge of an accident happening in shifting those cars with the Springfield brakes on them? If so, please state what you know about it." Said Braman replied, "Yes, sir; I was running on the train, and was taken sick in the morning. I came in at night; I had a brother running on the Newton Lower Falls train; when we came in at night I asked M'r Hobart, the depot-master; told him I was sick, and asked him to let my brother do my switching. So he did, and I went home. The first thing I heard in the morning was that the bunter-post in the depot was all smashed off, and the rear platform of the rear car, and the platform of the second car." "Int. 22. Do you recollect the number of that car?" "Ans. No, sir; it was 123 or 124; I don't know which car was behind." "Int. 23. How badly smashed were the platforms of either of these cars?" "Ans. The rear platform of the rear car—the bed pieces were broken off. That was the car that struck the post, and the rear platform of the second car was injured. It wasn't smashed off entirely, but it was so that it had to be sent to the shop to be repaired." Do you know anything about this smashing platforms in cars 123 and 124?

A. No, sir.

Int. 10. Were you there so that you might know if anything of that character took place?

(Objected to.)

A. I can't tell exactly whether I was there that day or not; but I think likely I was.

Int. 11. If anything of that kind had happened to cars 123 and 124, would you have known it?

(Objected to.)

A. I should have been very apt to.

Int. 12. Have you any doubt that you should have known it?

(Objected to.)

A. No doubt whatever.

Int. 13. Interrogatory 27 put to said Braman is as follows: "How

well, if at all, were you able to take up the slack of the train
2168 when the Springfield-brake car was the rear car of the train?" Ans. "It was impossible to do it." Have you had any experience with the Springfield brake that would corroborate this statement?

(Objected to.)

A. None at all.

Int. 14. What has been your experience in reference to that brake?

(Objected to as leading.)

A. I have taken it up, and used it just the same as other brakes on the road. I never found any difficulty with it.

Cross-examination by M'r Cozzens:

Cr.-int. 1. Is it just as good as the Hodge brake?

A. It is to me. I do not apply it, sir.

Redirect:

Int. 15. About how often have you renewed the shoes on car 123 having the Springfield brake thereon, since the brake was put on in December, 1872?

A. I can't say exactly how often.

Int. 16. Well, about how often?

A. I should say three, four, or five times. They were renewed about a fortnight ago.

Int. 17. Did I understand you that the shoes require renewal about once in five or six weeks?

(Objected to as leading.)

A. It depends altogether upon where the cars run.

Int. 18. I mean one run regularly between Boston and Albany, going out one day, and back the next?

A. They require renewing about once in six weeks on that train.

Int. 19. And have they, according to your best judgment, been so renewed since December, 1872?

(Objected to.)

A. I should say so. I can't say for a certainty.

Recross:

Cr.-int. 2. How may cars on the Boston and Albany Railroad now have the Springfield brake on them?

A. There are four, I think.

Cr.-int. 3. How many had it on at the time you gave your testimony in this case, July 31, 1872?

2169 A. Five.

Cr.-int. 4. Do you know of the sending out of Jennings' train last Thursday from Boston to Albany at the time when brakemen O'Brien and Gardner, and also M'r Waterman were sent on it.

A. Yes, sir.

Cr.-int. 5. The Springfield brake was in four cars of that train, on that day, was it not?

A. Yes, sir.

Cr.-int. 6. Were the Springfield brakes on those four cars on that day in a bad state of adjustment?

A. I should say not.

Cr.-int. 7 Was the adjustment good and perfect, in your judgment?

A. Yes, sir; about the same as they have been running.

Cr.-int. 8. What, if you know, was the design when that train was sent out? Was it to go to Albany and return with those brakemen, and M'r Waterman on it?

A. I knew they were going out; I didn't know anything about their return. I knew they were going to Albany.

Cr.-int. 9. Did you see them when they came back?

A. No, sir. The first I saw of them was in the office of M'r Yerrington, in Pemberton Square.

Cr.-int. 10. When did you expect them back?

A. I expected them back on the same train the next day—I did.

Cr.-int. 11. Did you examine the adjustment of the Springfield brakes on that train that morning?

A. No, sir. The train goes out at five o'clock. I wasn't there.

Cr.-int. 12. When were the cars composing that train backed down into the depot ready to go out at five o'clock that morning?

A. They switch out of the house on to the starting track in the morning.

Cr.-int. 13. When was the train made up for that morning?

A. The cars were arranged in the way in which they were to
2170 go out, the afternoon before, and about twenty minutes before
five o'clock that morning, they were run from the house where
they had lain all night, down on to the starting track to go out.

Redirect:

Int. 20. Was the train made up any differently that morning from any other morning?

A. It was left the same as it generally is when I left the depot. I don't know how it was made up or put on the starting track, for I wasn't there.

Int. 21. How much of the time the afternoon before you went home at night, was that train in the depot or in the house at Boston?

A. I went home at six o'clock, and it was there from about 3:30 up to that time.

Int. 22. Did you, during any part of this time, look to see how the brakes were adjusted?

A. Yes, sir; I always do on every train.

BENJAMIN RAY.

Deposition of James A. Clark.

Int. 1. What is your name, age, residence, and occupation?

A. My name is James A. Clark; age, forty-three; residence, Boston; occupation, car-builder.

Int. 2. How are you now occupied?

A. I am inspector of cars on the Boston and Albany Railroad at the Boston and Albany depot in Boston.

Int. 3. How long have you been inspector of cars at the Boston and Albany depot?

A. I have been up to the depot there about three years come this November, I think, but I have been on freight, more or less, three or four years.

Int. 4. How long have you been inspector of passenger cars?

A. About three years.

Int. 5. Does looking after and repairing brakes, adjusting, etc., of the same, come under your department?

A. Yes, sir.

2171 Int. 6. Do you know anything about a number of cars being
equipped with what is called the Springfield brake?

A. Yes, sir.

Int. 7. How many cars were equipped with that brake and run in Jennings' train?

A. Five.

Int. 8. When was the brake taken off from one of those five cars, and under what circumstances was it taken off?

A. No. 124 broke down and run over a broken rail last winter; broke the truck and brake, and they put the Miller platform on to it.

Int. 9. And at the same time what brake did they put on?

A. The Hodge brake.

Int. 10. And took off the Springfield brake?

A. Yes, sir.

Int. 11. How many cars are now used in Jennings' train with the Springfield brake on them?

A. Four, I think.

Int. 12. How long has that train been running with the Springfield brake, should you judge?

A. A year and more, I should think.

Int. 13. Do you know Marcus L. Braman, who was formerly brakeman on Jennings' train?

A. I used to see him come in there on it.

Int. 14. What, if anything, did you ever hear him say in relation to the operation of the Springfield brake?

(Objected to.)

A. He said it was as good a brake as he wanted. He didn't want any better brake than that.

JAMES A. CLARK.

Deposition of Emery Stebbins, recalled.

Int. 1. Are you the Emery Stebbins who was examined in this case in the year 1872?

A. I am; I was examined in Springfield.

Int. 2. Please look at "Defendants' Exhibit, Springfield brake No. 3," and state whether the brake thereon is a correct representation of the one applied to the cars on the New York and Boston express line about the year 1856, and run thereon sixteen months, as testified by you in your examination aforesaid in 1872? 2172

A. It is the same thing.

Int. 3. Was the brake so represented on said exhibit applied by you to the New York and Boston express line cars about the year 1856?

A. It was.

Int. 4. Did you furnish the drawings from which the brake on said exhibit was made?

A. I did. I furnished M'r Whipple with drawings, and the model is like those drawings.

Int. 5. On cross-examination, at the time aforesaid, you testified that "the bottom end of the truck-lever set in a slot on the connecting rod, with a pin through it, so as to hold it permanently in its place, instead of being attached to the brake bar." Is the brake so described correctly represented in said "Exhibit, Springfield brake No. 3?"

A. It is.

Int. 6. In your direct examination at the time aforesaid you say, "All the difference between the brake exhibited in the model" (referring to the model described in that deposition as "Model A. E. Merwin, U. S. C."), "and the brake which was applied to those twenty-two or twenty-four cars, was that, in the brakes of these cars, but one chain wound round the windlass, and that chain was attached to the upper end of the lever in the first truck, and a rod attached to the same point connected it to the upper end of the lever in the second truck, and the same may be said of the attachment at the other end of the car. The reason why we put it on in this way was to get rid of the second chain, and save us the trouble of altering the windlasses." Is the same alteration seen in the model, "Defendants' Exhibit, Springfield brake No. 3," as is described in the language just quoted?

A. It is.

Int. 7. What kind of curves did the cars with said Springfield brake, marked "No. 3," have to pass over in the city of New York, to get into the station in New York City?

A. I can't tell the radius, but it is a very short curve. I did know the radius, too, once.

2173 Int. 8. Were you in New York at any time when the cars were run into that city with Springfield brake No. 3 on?

A. I was. I was only there temporarily.

Int. 9. At that time, did the cars run down to Canal street?

A. They didn't at that time.

Int. 10. Where did they run to?

A. They stopped at Twenty-seventh street.

Int. 11. How did the sharpness of the curves over which these cars were hauled with said brake affect the connections of said brake?

A. Well, they had to be connected very loosely to go round those curves and get into the yard.

Int. 12. How were the cars drawn round those curves?

A. By horses.

Int. 13. What would be the consequence were the brakes not adjusted very loosely in passing those curves?

A. It would stop the cars on the curves. They would not be very apt to leave the track, because the brakes would hug right on to the wheels.

Int. 14. How did this looseness of the brake, in order to pass said curves, affect its operations when upon the main track?

A. Made it very loose.

Int. 15. How did this looseness affect the operation of the brake?

A. It affected it in not holding the cars so well on account of its being so loose.

Int. 16. Were you in the habit of taking up the slack of the brake at Springfield?

A. We were when it was first put on, but we found that it made trouble for the New York folks in going round these curves in New York to get into the yard, and then we left them, as they adjusted them at the New York end of the road, which was quite loose, as seen in the exhibit.

Int. 17. And that adjustment was to allow them to pass those sharp curves without binding the wheels so as to stop the car on the curves?

A. Yes, sir.

2174 Int. 18. You will now please look at "Defendants' Exhibit, Hodge brake," and state whether the brake thereon correctly represents the same as applied to the said New York and Boston line of cars?

A. It does.

Int. 19. Did they, as represented, have a worm in each windlass-shaft?

A. Not every one of them. Part of them had them on, and some of them didn't.

Int. 20. Did they have a stop just back of the chain for the purpose of holding the rod and making a good brake at the opposite end, in the event the chain broke at the other end?

A. Yes, sir; all of them had the stop.

Int. 21. Did it also perform the office of relieving one end from the slack of the chain at the other end?

A. It did.

Int. 22. You were located at Springfield, Mass., as car-inspector of the Western Railroad at the time this change from the Hodge brake to the Springfield brake was made?

A. Yes, sir; I was located there, and put the brakes all on.

Cross-examined by M'r Cozzens:

Cr.-int. 1. State whether the Hodge brakes on this line of cars had the links holding up the cross-levers, so arranged as to run on slides, as shown in "Defendants' Exhibit," or was the top part of some of those links hinged to the car body, so as to swing instead of sliding?

A. Most of them swung, but there were a few of them that run on slides, like the "Exhibit."

EMERY STEBBINS.

Deposition of Benjamin W. Hobart.

Int. 1. What is your name, age, residence, and occupation?

A. Benjamin W. Hobart; I reside at the United States Hotel, 2175 Boston; am station-agent of the Boston and Albany road; I ran as conductor eighteen years, and have been in the station some six or eight years.

Int. 2. On what train did you run as conductor?

A. I ran the New York train between Boston and Springfield.

Int. 3. What is called the New York and Boston express line?

A. Yes, sir.

Int. 4. Do you recollect, during the time that you ran said train as conductor, of there being on said cars what is called the old Springfield brake?

A. Yes, sir.

Int. 5. Are you aware what kind of curves it had to run over to get into the station at New York, at Twenty-seventh street?

A. I have been over those curves, but I have no means of knowing the radius. I did not go through to New York. I ran from Boston to Springfield. It is just like going round the corner of one street into another.

Int. 6. How did the said Springfield brakes work when leaving Boston for Springfield, compared with when they came back from New York, and from Springfield to Boston?

A. The brakes always worked better out of Boston than they did coming to Boston.

Int. 7. How do you account for this difference?

A. I account for it by what the men on the train say. (Objected to.) I understand that the difficulty was from being obliged to let out the chain in order to go round those curves; let out the connections.

(Answer objected to.)

Int. 8. You are aware of the fact, are you, that the brake worked better as a general thing going from Boston, than it did when the train returned to Boston?

A. Yes, sir.

Int. 9. For the reasons you have stated?

A. That was always the explanation by the inspectors at Springfield. I get it from them.

(Same objection.)

Int. 10. Are you acquainted with Marcus L. Braman, who was formerly brakeman on the Boston and Albany road?

A. Yes, sir.

2176 Int. 11. How long has he been out of the employ of the company?

A. I should say a year.

Int. 12. Why did he leave the employ of the company?

A. That is pretty direct, but I suppose you want the fact. I discharged him for drunkenness.

Int. 13. Has there been used of late on the cars of the Boston and Albany road what is called the Springfield brake? If so, on what train?

A. No train except this that leaves Boston at five o'clock in the morning, and returns at half-past three—Jennings' train.

Int. 14. Has any complaint come to you in regard to the brakes on said train?

A. Well, I can't say that there has not been any complaint, because it would be very singular if any brake should run without any complaint. I think there has been no general complaint.

Int. 15. Have any accidents happened to that train within the last year?

A. None that I am aware of.

Int. 16. Do you consider the brake as used on Jennings' train, known as the Springfield brake, a safe brake to run on that road?

A. Well, the question of safety applied in what way?

Int. 17. As a general thing?

A. If adjusted, I consider it a good brake.

Cross-examined by M'r Cozzens:

Cr.-int. 1. You mean if carefully adjusted?

A. If the brake is properly adjusted.

Redirect:

Int. 18. And the wear of the shoes kept up?

A. Yes, sir.

Recross:

Cr.-int. 2. Do you consider the Springfield brake as good a brake as the Hodge brake?

A. No, sir, I don't.

2177 Cr.-int. 3. If you were the manager of a railroad, with such experience as you have had with the Springfield brake and the Hodge brake, would you use the Springfield brake on your cars, if you could get the Hodge brake?

A. I would not. I would give the Hodge brake the preference over any hand brake I ever saw.

Cr.-int. 4. Do you know of the sending out of Jennings' train last Thursday with the brakemen, O'Brien and Gardner, in connection with M'r Waterman?

A. Yes, sir. They went out on that train on Thursday, and went through to Albany.

Cr.-int. 5. Was the intention to run that train to Albany and back with those parties on it?

A. To run to Albany, but not back. The men only went to Albany, and returned by the next train. The regular men managed the train the next day.

Cr.-int. 6. I don't ask whether they did come back. I ask whether it was the intention to have them come back on the same train?

A. No, sir, it was not.

Cr.-int. 7. When did you expect those men back?

A. I expected them to come back that night or the next morning, as they saw fit, as passengers, because it was a hard day's work for the men to go from here to Albany, and brake at all the stations. I looked for them to come back at their own convenience, because I didn't expect them to do any work the next day. One came back that night, I think. It was not expected that they would make the round trip. I gave the order, and it was merely to go to Albany, and return at their convenience, or as soon as they could.

Cr.-int. 8. Are O'Brien and Gardner good brakemen?

A. Yes, they are considered such.

Cr.-int. 9. Is O'Brien still employed as a brakeman on the Boston and Albany road?

A. Yes, sir. M'r Gardner left of his own accord.

BENJAMIN W. HOBART.

(Indorsement on cover:) No. 306. The Chicago and Northwestern Railway Company, appellant, vs. Thomas Sayles. N. Illinois C. C. U. S. Filed 8th November, 1875.

[illegible] N. H. Sm

No 46 [illegible]

Oct. 9. 187

United States Supreme Court.

CHICAGO AND NORTHWESTERN RAILWAY
COMPANY, *Appellant,*

vs.

THOMAS SAYLES, *Appellee.*

ARGUMENT FOR APPELLANT.

BY GEORGE PAYSON.

CHICAGO:
[illegible] [illegible] Company, 112 [illegible] [illegible].
187

SUPREME COURT OF THE UNITED STATES.

CHICAGO AND NORTHWESTERN RAILWAY COMPANY, *Appellant*,
v.
THOMAS SAYLES, *Appellee*.
No. 306.

STATEMENT OF THE CASE.

This is a suit on a patent on car brakes, issued July 6, 1852, to Henry Tanner, assignee of Batchelder and Thompson, and assigned by Tanner to plaintiff. The original application, filed June 26, 1847, was for a "train" or "bumper" brake, operated by the cars crowding on each other, when the train slackens its speed. It was a crude and clumsy contrivance, and was never used, according to plaintiff's evidence in a single instance, and only once or twice according to defendant's, when it failed and was abandoned. Nearly five years after, the invention was assigned to *Tanner;* new and different specifications, drawings and model were filed, describing a brake of a very different and improved construction; not, as we believe, the invention of *Batchelder & Thompson*, but interpolated into the case by the said *Tanner;* the same brake having been invented and brought into public use at least as early as the spring of 1848, by one *Willard I. Nicholls*, and the brake used by appellant having been invented and patented by *F. A. Stevens* in 1851. The brake thus patented to *Tanner* was not a "train" brake, but a hand brake; it proved successful, and has been used on some of our roads, under the name of the "Tanner brake" from that day to this. The brake generally in use prior to 1850 was the old single brake, so called because it applied the brakes only to a single truck; though in fact a double brake, since it operated on all four wheels at once. This brake is still in use on freight cars, a few roads only having adopted the double brake on that class, as well as on their passenger cars. The improvement in this Tanner brake consisted in connecting the two single brakes, that is, the brake on each truck, with each other, and with the windlasses *by means of a centre lever*, so that all the brakes could be applied at once from either end of the car.

Other double brakes had been invented and used prior to the alleged invention of the *Tanner*, one of which still continues in use; but all these were held either not the same as the *Tanner*, or else abandoned experiments.

The double brakes now and for the past twenty years in use on most of our roads are the *Hodge* and the *Stevens*, the former patented in 1849, the latter in 1851. Both are claimed to be infringements, but this we wholly deny. The *Stevens* brake is the only one now before the court.

This suit was begun in 1861; the defendants denied the validity of the patent, and also denied infringement; both of which issues having been decided against them, the case was referred to the master, who found the saving to defendant in brakemen and wheels, by the use of this invention for five years, on only a small part of its road to be $63,638.40. Defendant's exceptions were overruled, and a decree entered for that amount. A petition was filed to open the decree on the ground of newly-discovered evidence; and on the argument a number of other points were presented by defendant. None of them, however, was sustained, but it having been shown that the damages decreed gave a value to the patent of at least sixty millions of dollars, the court, without assigning any other reason for it than that the damages were too great, struck off some $16,000.00 and entered its decree for $47,725, from which the defendant appealed.

The case is one of the most important that ever came before this court. If this decree is correct there is hardly a road that has not infringed this Patent. Its value as fixed even by this last decree cannot be less than Forty Millions of Dollars. A large number of other suits all over the country, now pending or soon to be brought, are awaiting the issue of this. Most of the defendants in these suits have never used anything but the *Hodge* or *Stevens* brakes. They have bought and paid for them on the belief that they were independent inventions, and no infringement. Yet they are now called upon to pay for the *Tanner* in addition, and to pay a sum so large, according to this decree, as to leave most of them no refuge but in bankruptcy.

QUESTIONS IN THE CASE.

1. Is not the patent void for errors affecting the application?
2. Is it not void for want of novelty?
3. Is the Stevens Brake an infringement?
4. Is not the estimate of savings excessive?
5. Was the correct rule adopted?
6. If so, was it correctly applied?

ASSIGNMENT OF ERRORS.

First. The court erred in not finding the patent invalid; for

The delay in prosecuting the application—The change made in the amended application—The delay in making this amendment—The doubt as to who was the author of it—The peculiar circumstances attending it. Or all of these causes taken together.

Second. In finding that Batchelder & Thompson were the inventors of the Tanner brake.

Third. In not finding the patent void for novelty, in view of

The Millholland Brake;
The Nicholls Brake;
The Stanley-Talson Brake.
The Camden and Amboy Brake.

Fifth. In its construction of the Patent.

Sixth. In finding that the *Stevens* Brake was an infringement.

Seventh. In directing the master to assess damages in addition to profits.

Eighth. In finding any saving of brakemen.

Ninth. In finding that defendant saved as many brakemen as it employed.

Tenth. In finding any saving of wheels.

Eleventh. In first assessing the saving of *brakemen* on the theory that twice as many must have been used with the single brake as with the double; and then assessing the saving of *wheels* on the theory that the same number of brakemen were used with both.

Twelfth. In charging defendants with an additional number of brakemen equal to those they employed; and then refusing to give them the benefit of that increased number, in estimating the saving of wheels.

Thirteenth. In assuming that whatever was saved by the double brake was the same as so much profit to defendant.

Fourteenth. In overruling defendant's exceptions to the master's report, severally and collectively; as follows:

1. For that the said master decided and in and by his said report stated that the brake known as the "Springfield Brake" was an unsuccessful and abandoned experiment and not a perfect practical invention, in disregard of the testimony of the witnesses William Jennings, Wilson Eddy, Henry W. Snow, John Mulligan and John B. Adams, as to the successful working of said "Springfield

Brake" long prior to the alleged invention of Batchelder and Thompson, and which testimony was before said master on said reference.

2. For that the said master, as appears by his report aforesaid, computed the amount saved to the defendant by the use of the Batchelder and Thompson invention over the use of the single brake, rejecting as a standard of comparison what is known in this cause as the "Springfield Brake," thereby wholly disregarding and refusing to consider the testimony of the witnesses before named in the first exception, and also the testimony of the witnesses Benjamin W. Hobart, James A. Clark, Benjamin Ray, Edward Lang, Benjamin C. Read, Henry Waterman, William O'Brien, George H. Gardner, Alfred Berney, John A. Hearn, V. D. Perry, S. L. F. Deyo, Only L. Smith, Henry F. Sampson, William McCormick, Henry A. Wright, Robert Hitchcock, Alpheus Wing, John D. Emerson, John C. Blood, H. M. Rogers, G. F. Lincoln, John Lightner, James Lyon, Charles Haradon, Henry F. Taylor, John Bartlett, William W. Stevens, Charles W. Marsh, John B. Adams, R. C. Steele, Cornelius Teeling, Lewis A. Shorts, Luther D. Hodgkins, John A. Smith, John W. Clark, F. D. Adams and William H. Russell, introduced before said master in said reference by the said defendant, showing the successful working of said "Springfield Brake" as a double brake.

3. For that the said master, as appears by his report in estimating the gains, profits, savings, benefits and advantages, accruing to the defendant by the use of the Batchelder and Thompson invention, as set forth in the Letters Patent to Harry Tanner, wholly disregarded the advantages of the double-acting brake known as the "Springfield Brake," over the single brake, as testified to by the defendant's witnesses above named in the first and second exceptions, and made comparison of the said Tanner brake directly with the single brake; whereas under the testimony aforesaid the comparison should have been made by him between the Tanner brake and the said "Springfield Brake."

4. For that the said master has assumed, and in and by his said report decided that, with single brakes, the defendant would have been compelled to employ double the number of brakemen and baggagemen in the management of its trains, that it did employ with the double brakes.

5. For that the said master in the making up of the account between the complainant and the defendant, assumed that by the use of the invention of Batchelder and Thompson, the defendant made a saving of the wages of one half the number of brakemen upon its passenger trains, when the fact is, as shown by said report that the defendant during all the term covered by said account, used the Stevens brake upon all its passenger cars.

6. For that the said master in the making and stating of the account between the said complainant and the said defendant, has allowed to the said complainant all the gains, savings, and benefits accruing to the defendant from the use of the best form of double acting brake, and has not in any manner made allowance or deduction therefrom on account of the defects and want of adjustability of the Tanner brake.

7. For that the said master in estimating the gains, profits, benefits, and advantages derived by the said defendant from the use of double brakes, has not allowed for any difference between that form of double brake known as the Stevens brake, which, as appears by said report, was exclusively used by the said defendant during the time covered by said report, and that form of double brake claimed to have been invented by Batchelder and Thompson, and described in the Letters Patent to Henry Tanner.

8. For that the said master has found, and in and by his said report decided that by the use of the alleged invention of Batchelder and Thompson, in

the Stevens brake there was a saving to the defendant of two sets of car wheels to each car per year.

9. For that the said master has found, and in and by his said report decided, that the Batchelder and Thompson invention embodied in the Stevens brake used by the said defendant, resulted in saving to the said defendant two sets of car wheels per car per year, during the entire time covered by said account, comparing said brake directly with the single brake, in order to reach that result, and making no allowance for the imperfections of the said Batchelder and Thompson invention when tested by itself.

10. For that the said master has assumed contrary to the facts as shown by the complainant's own witnesses, and in and by his said report has in substance decided that the use of the Batchelder and Thompson invention prevents the injury of car wheels by "spotting," and that this cannot be prevented by the use of the single brake.

11. For that the said master, in and by his said report, has calculated as the gains, savings, advantages and benefits accruing to the defendant from the use of the alleged invention of Batchelder and Thompson, not only the savings in the wages of brakemen, but also the savings in car wheels, the effect of which is a partial duplication of the actual gains and savings resulting from the use of a double-acting brake.

12. For that the said master, in the making and stating of the account, between the said complainant and the said defendant has not based the same upon the actual gains and savings resulting to the defendant from the use of the invention of Batchelder and Thompson, nor upon the testimony before said master as to the use of said invention by said defendant, but instead thereof has estimated said gains and savings according to vague and indefinite impressions of certain witnesses who testified in respect to the supposed savings in car wheels resulting to other railroad companies from the use of double-acting brakes on their cars.

13. For that the said master in the said report wholly disregarded the brake called the "Tender Brake" proved by the testimony of Wilson Eddy and others to have been in use continuously since 1843 and long prior to the alleged invention of the Tanner brake, and excluded the same in his comparison of the Tanner brake with prior devices and made his comparison of said Tanner brake directly with the single brake.

ARGUMENT.

(The references are to the top paging of the record. Figs. 1, 2, etc., refer to the figures in the chart at the front of this brief.)

I.

THE PATENT WAS VOID BY REASON OF THE ERRORS AND FRAUDS IN THE APPLICATION.

There are here several points distinct, yet working together.

1. By their *delay in prosecuting their application* the appellants forfeited their right to a patent. They filed their application June 26, 1847. It was wretchedly defective; the specification was most of it written on the face of the drawings; the description very imperfect, and the claim, "*The application to car brakes, to prevent collisions, &c., &c.*" p. 137.

December 9, 1847, they wrote to the Patent Office to stay proceedings, as they wished to make some further improvements; when, of course, the office did as requested. p. 138.

After this it may be supposed that they busied themselves in making the proposed improvement; they did nothing of the kind, however, according to the statement of Batchelder, p. 94; but having in about a month found out that they *wanted no improvement*, they then stood still till October 4, 1850, when *Heath*, their assignee, wrote to have the papers returned (for what reason does not appear) to *R. H. Eddy*, his attorney and an experienced patent solicitor, who, after keeping them idle in his hands for nine full months longer, returned them to the office, in the same imperfect shape in which he received them, without any change or amendment whatever. p. 139.

Just two months later, September 10, 1851, *Eddy* wrote to the office asking an examination; and thereupon, October 17, or little more than a month, the papers were examined and "returned for *entire insufficiency*," the correctness of which ruling has never been questioned.

Then comes another delay of six months on the part of the applicants, when on the 13th of April, 1851, *Eddy* returned the papers to the Patent Office with amendments, the character of which will be fully shown hereafter.

April 30, only 17 days after the office received the papers, they were again sent back, there being an entire discrepancy between the model and drawings, which could only be removed by the substitution of either new drawings or a new model. A new model was accordingly got up by *Tanner*, who had now become sole owner of the invention; and finally, July 6, 1852, *more than five years after the original application*, the patent was issued in its present shape.

They excuse this delay on various grounds, their own inexperience; the neglect of their agent; the neglect and crowded state of the Patent Office; and in support of this last, one *Cooper*, the Examiner in charge, is made to swear that the office was then a year behind hand, and that no new application could be examined for at least a twelve month.

As to the inexperience, we deny that it is any excuse. A party who pleads his own case, finds no favor on that account; but on the contrary is very apt to be turned out of court with a proverb anything but complimentary sent after him by way of reminder. The neglect of their agent is the same as their own. Moreover, their agent, *Heath*, was himself a principal, having become sole owner of the invention by assignment, April 17, 1847, before the filing of the application. p. 93; 138.

As to the crowded state of the Patent Office, *Cooper's* statement even if true, would only account for one year; and here is a delay of five. Neither will this excuse the delay of *Eddy* in keeping the papers nine whole months, and then sending them back in the same defective shape in which they were first prepared; nor the subsequent delay of six months in making the amendments. Nor did this press in the Patent Office prevent other more diligent inventors from obtaining their patents, and in the same department. *Stevens* obtained his patent in 1851, *Hodge* in 1849, *Turner* in 1848. There is no need, however, of arguing this point, for it is evident that the delay was due to none of these causes, but to the letter of applicants, in which they expressly instructed the Office to stay proceedings. It is true they allege that they afterwards wrote several times in relation to the examination, but received no reply.

But, if they wrote so many letters, why are none of them on file in the Patent Office? And when they did write in October, 1850, why was nothing then said as to their prior unanswered letters, or any neglect on the part of the Office? And if they did write those letters, how do we know what they contained, or that they required any answer? *Eddy's* letter of Sept. 10, 1851, gives us no light on either of these points. Nor is that letter any evidence even that any prior letters had been written. It is simply an unsworn statement of *Eddy* as to another unsworn statement of applicants.

The fact is, as we shall show, that the brake really invented by *Batchelder and Thompson* was worthless, and that they knew it; it was no more than natural, therefore, that they and those with them should press their application in the intermittent, half-hearted manner just shown.

Then how does this delay affect the patent? The authorities all assume that there *is* a delay which shall be fatal. Thus in *Adams v. Jones*, 1 Fish 529, it was held that the applicant, having by his application given notice of his intention, ought not to lose his rights by *mistakes in the Patent Office*, or delays in courts, *unless gross laches be imputed to him.* But that one might justly be treated as having abandoned his application if not prosecuted with reasonable diligence.

So in *Rich v. Lippincott*, 2 Fish. 9; *Dental Vulcanite Co. v. Weatherbee* 3 Ib. 87; *Blandy v. Griffith*, Ib. 609; *McMillen v. Barclay*, 5 Ib. 189; *Johnson v. Fassman*, Ib. 471; *Goodyear Dental Vul. Co. v. Smith*, Ib. 588; *Roberts v. Ryer*, 6 Ib. 309; *Jones v. Sewall*, Ib. 365; *Howe v. Williams*, 2 Cliff. 262; *Smith v. Goodyear Dent. Vul. Co.*, 3 Otto, 486.

All these cases decide by necessary implication that the delay would have been fatal if it had been in the power of the applicants to prevent it. As to the time lost by the delay, it was held in *Blandy v. Griffith* that a delay of *only eleven months*, was under the circumstances "*not unreasonable.*" There an erroneous rejection on appeal had been made; but no one pretends that there was anything of the sort in this case.

In *Clark v. Scott*, Off. Gaz. II, p. 7, defendant claimed that the patentee's neglect to prosecute his claim after rejection, for two years and eight months, was an abandonment. Held by *Blatchford*, J., clearly agreeing with that view of the case, that defendants could not avail themselves of it, because not set up in their answer. The answer in this case does contain that allegation.

Where one suffered his claim to remain as a rejected application more than five years, held to have forfeited his right to a patent. *Raymond, ex parte Merrick*, J., 1861. See also *Ellithorpe v. Robertson; Justice v. Jones; Spear v. Stuart; Savory v. Louth; Marcy v. Trotter; Berg v. Thistle; Sturtevant v. Greenough; Loveridge v. Dutcher*, and *Snowden v. Pierce;* Law's Dig., 146–148.

So in *Bourcicault v. Hart*, 8 Chi. Legal News, 258, it was held that an author must publish his book in a *reasonable time* after filing the title page; and the same rule is there said to apply to patents. "The inventor must put his claim into the form of a well defined specification, and so place it upon record that he *cannot alter it to suit circumstances*, and so that other inventors may know precisely what it is that has been invented." "It was never heard, however, that he could conceal the particulars of his invention, and by filing a general statement of an improvement, cut off the rights and claims of others." The delay there was only about six months.

The Act of Congress of 1870, Sec. 32, fixes two years as the time within which the applicant must proceed after any action by the Patent Office. This does not affect prior applications, but is cited as showing the views of Congress on this subject. And it was held by Dunlop, J., as long ago as 1861, that two years was the utmost that the applicant should wait after a rejection, though there was then no statute to that effect. *Snowden v. Pierce*, Law's Dig., 149. The above cases will be found still more applicable when we come to consider the *amended* application.

It may be said, however, that there was never any abandonment of this application; that the evidence clearly shows an intention to prosecute it; and that unless the parties did intend to abandon it, they were entitled to a patent.

But without any positive act of abandonment, one may yet forfeit his right to a patent by his delay. Of what importance is it if I state every day that I intend to prosecute my application, if I never do prosecute it, or prosecute it with so little energy that long before I am ready "another steppeth down before me?" If no delay will work a forfeiture, then one may wait fifty years or a hundred.

We have thus far assumed that the brake patented was the same as that in the original application. But this was far from being the case. The *Batchelder & Thompson* brake was a "bumper brake," a brake to be operated by the cars crowding upon each other; it was of no value and never came into use. The *Tanner* brake, on the contrary, was not a "*bumper*" brake at all, but wholly a *hand* brake; it was far superior to the other, and has continued in use to this day.

Then, if it be true, as they are forced to claim, that *Batchelder & Thompson* invented this far superior brake at the same time they invented the wretched contrivance shown in their original application, by what right could they keep it from the public all these years? There may have been reason in the claim, that, having filed their application, they thereby showed their intent not to abandon that invention; but this does not apply to the invention for which they obtained the patent. Their first application neither described or indicated that invention. They kept that invention, if they really made it, lying by them five years; and then at last, years after others had invented the same thing, and given it to the public; after others had patented still better things, they filed an amended application in which they described and claimed the *Tanner* brake; the *Nicholls* brake, which was precisely the same as the *Tanner*, having been known at least as early as 1847, and the *Stevens* brake, used by appellant, having been patented in 1851, and the *Hodge* in 1849. If this is diligence and good faith, then those things must have changed their names.

Again, *Batchelder* swears that he saw this brake in use on two other roads in 1850. p. 94. If he did, it was all the more his duty at once so to amend his application as to embrace this device. *Shaw v. Cooper*, 7 Pet. 319–323; *Rawson v. Mayor of New York*, 1 Fish. 272; *Treadwell v. Bladen*, 4 Wash. 708; *Whitney v. Emmett*, Bald. 311; *Kendall v. Winsor*, 21 How. 329; *Walker v. Forbes*, Dunlap J. Law's Dig. 149; *Wilton v. Railroad Co.*, 2 Whart. Dig. 410; *Winans v. Schen. and Troy R. R.*, 2 Blatch. 291, 300.

These cases decide that if an inventor finds his invention in public use, he must at once apply for a patent, or forfeit his right.

II. What has been said above applies solely to the question of delay. But in the next place we insist that the change here made in the character of the invention was sufficient to defeat the patent, no matter when made.

We deny that an inventor has a right thus to change the whole character of his invention. We deny that he may lawfully cancel every part of his original specification, drawings and model, and put entirely new and different ones in their place. He may change the details of construction, but he cannot change its essence. In short, our proposition here is this, that nothing shall be introduced into a patent by way of amendment which is not described, indicated or suggested, either by the original specification, drawings or model. And it seems to us that this Court cannot in view of the law and its own repeated decisions come to any other conclusion.

Section 7, Act of 1836, provides that if the applicant whose claim is rejected persists in his claim, with or without any alteration of his *specification*, he shall make oath anew. And if his *specification and claim* shall not have been so amended as to entitle him to a patent in the opinion of the Commissioner he may appeal. This is all there is as to amendments. And it is noticeable that, while no leave to amend is expressly given, the leave that is implied is confined to the specification. Nothing is said as to the model. The case then is clearly one for judicial construction.

The only case, so far as we know, bearing directly on this question, is *Singer v. Braunsdorf*, 7 Blatch. 521. It is there taken for granted that the power to amend the application is limited as in case of a reissue, and that nothing can be added that is not found or indicated in the original.

In *Godfrey v. Eames*, 1 Wall. 325, this court held that no amendment can be allowed to introduce a "distinct and different invention, and one not contemplated by the specification as submitted at the outset." But the precise question now under discussion was not before the court. The court did decide that the amendment must be for the *same invention*, but not how this sameness was to be determined.

In another class of cases, however, we find decisions exactly in point. The rule first suggested in *Woodworth v. Stone*, 3 Story, 753, in 1845, and afterwards more fully defined in *Carhart v. Austin*, 2 Fish. 553, and other cases on the circuit, viz., that nothing can be included in a *reissue* which is not described or indicated in the original specifications, drawings or model, has been fully adopted by this court. *Seymour v. Osborne*, 11 Wall. 544; *Gill v. Wells*, 22 Ib. 24. And Congress has here followed the courts. By analogy of reasoning, the same rule must be applied to amendments. The reasons which led the courts to establish this rule in the one case apply with equal force to the other. In each case it is a rule plain, simple and easy of application. It leaves nothing for construction. It is easy to see at once if the proposed amendment existed in the original. If it did, there can be no harm in adding it to the patent. If it did not, there can be no injustice in requiring a separate application. No other rule can be found not open to grave objection. Thus it may be said that there can be no harm in allowing any amendment that does not *change the character of the* *invention*, and that there is no need of defining the rule within narrower limits. But the courts have seen fit to lay down a more definite rule as to reissues, and for very good reasons. It is not always easy to tell just what is the "character" of an invention, or whether it has been changed. There is room for a wide difference of opinion on both these points. Thus the right of amendment would be a constantly shifting quantity; it would be allowed by one judge or examiner, and denied by another; while, if nothing can be admitted which is not indicated in the original, we have at once the utmost possible uniformity and precision.

These two analogous sections of the Act are also thereby brought into entire harmony, and we are spared the trouble and confusion arising from having one rule in the one case, and a repugnant rule in the other. In the case of a reissue this court has even gone so far as to say that it would present a question of fraud for a patentee to do what has been done with the original application here. *Brooks v. Fiske*, 15 How. 220. And see *Whitely v. Swayne*, 4 Fish. 127-8.

It may be said, however, that the two cases are not parallel, that the rule as to reissues rests on the act of Congress, while there is nothing of the sort as to amendments.

But this is a mistake. The rule as to reissues is purely one of judicial construction. There is not a word in the act even suggesting it. All that Congress has to say on the subject is that the reissue shall be for the *same invention*. How this sameness is to be proved is left for the courts to determine. The Act then really amounts to nothing; for even without it the courts would have held that to be the law. In fact, this is precisely what they have done in regard to amendments. The Act makes no such requirement, viz.: that they shall be for the same invention; yet this court has not hesitated to insist upon it.

In other words the courts have done for amendments just what Congress has done for reissues. We have reached, therefore, the same point as to both these questions; by different roads, it is true, but one as good as the other. The courts have then gone one step farther with reissues, and held that nothing shall be deemed the *same invention* that is not indicated in the original specification, drawings or model; how can they refuse to take that step with these amendments?

If the court agrees with us, that is an end of the case. If they agree with us that this is a good rule to apply to reissues, and a good rule to apply to amendments; that it is well calculated to prevent perjury and fraud, to save inventors from the temptation to appropriate the inventions of others by foisting into their applications what they never invented, or what others had invented before them, the court will at once pronounce the patent invalid on this ground alone. But the court may not agree with us. They may say for some good reason we have failed to find, that the same rule of evidence ought not to apply to amendments that applies to reissues; that while it is all right and proper to decide the question of identity of invention in the one case by reference to the original specification, drawings and model alone, yet that it is better to decide the same question in the other case in some entirely different way. The court may hold that the record alone shall be looked at in the case of reissues, and yet admit the testimony of experts and other outside evidence in the case of amendments.

But even if the court should decide this point against us, we do not see how it can affect their final decision. The difference between the two machines is so gross and palpable that, no matter what test we apply, or what rule of evidence we adopt, we come to the same end. In construction, operation, purpose and result we shall find them totally unlike.

Before this alleged invention the brake in general use was what is known as the Single Brake, operating on only the four wheels in one truck from one windlass. It is claimed by the patentees that this was the only practicable brake in use on passenger cars, and that they were the first so to connect the two single brakes, with each other and with the windlasses as to enable the brakeman to apply the brakes of both trucks at once from either end. In the patent they do not claim this combination generally, but only when it is effected by means of the vibrating lever A, or its equivalent, or mechanism essentially as specified. We do not admit that there were no double acting brakes previous to this invention, but let us suppose that such was the fact. The patentees will then appear as improvers of the old Single Brake by adding to it the vibrating lever and its connecting rods, so as to combine the brakes and windlasses of the two trucks for the purpose described; thus making what is now known as the double brake acting on all eight wheels at once, instead of only four.

Now we admit that both these brakes, that in the original application, and that patented, have a centre lever, and that both were *intended* to operate on eight wheels from either end of the car; but here all resemblance ceases. Thus, the centre lever in the *Batchelder and Thompson*, Fig. 5, does not operate and was not intended to operate like the centre lever in the *Tanner*. First. It does not receive the power from the windlass, and transmit it to the brake levers, but receives it from one brake lever, and transmits it to the other. Thus one brake lever is operated directly from the windlass, *without having anything to do with the centre lever*, while the other brake lever is operated by the centre lever. As to the brakes in one truck, therefore, the centre lever is wholly idle; the brakes in that truck being operated solely by the chain running from the windlass over the pulley in the frame. We repeat then that in this *Batchelder and Thompson* brake the centre lever is always and necessarily used only to operate the brakes in one truck. In this sense therefore it is only half of a centre lever brake.

Second. This centre lever is so constructed that in operating its one set of brakes, it has both to push and to pull. One of its rods is a pull, and the other a push rod, alternately ; the consequence is that both these rods have to be made very thick and heavy to stand the thrust.

Third. This centre lever does not increase the power of the windlass, and cannot increase it, while at the same time the great loss of power from the use of the pulleys renders this defect all the more serious.

If now we turn to the *Tanner*, Fig. 6, we find little of the old brake left. The clumsy arrangement of pulleys and push rods is discarded ; and in place of them there are four light pull rods attached to the centre lever, by means of which an entire change is effected in its operation. The centre lever now operates both sets of brakes, instead of only one set as before. It is now for the first time truly a centre-lever brake. This centre lever receives the power from either windlass, and transmits it to all the brakes. It not only transmits the power, but largely increases it.

The two rods that run from the ends of the centre lever of *Batchelder and Thompson* to the brake levers, are in the *Tanner* disconnected from the brake levers, and carried over to the two windlasses, and are thus made to perform an entirely new and different function. They have now nothing to do with the brake levers, but their office is simply to move the centre lever.

Then we have two additional rods, not found at all in the *Batchelder and Thompson*, one end of which is attached to the centre lever at some distance from its centre, and the other end to the brake levers in the trucks. We have thus four connecting rods instead of two—all of them tensile or pull rods—and no two of them answering to the two connecting rods in the *Batchelder and Thompson*.

The change thus made is in the highest degree important. It is not the addition merely of two new rods, leaving the other parts unchanged, though that would be enough to make it an essentially different device ; but it is far more than that. It involved the making over of the whole machine. *It represented all that difference, so often insisted on by the courts, between failure and success.* Instead of a brake that has never been in use, even on a single car, and that never would or could have been used, it has given us a brake that has been in use from that day to this.

In the next place the *purpose* of the two brakes was wholly different. The *Batchelder and Thompson* was nothing but a *bumper brake*, to be operated by the crowding of the cars.

The specification starts out with the statement of invention. In this the letters A, C, D, H, and I are the parts claimed as their improvements. p. 135. A is the two rods running to the center lever ; C the point where these rods are attached to the brake lever, and where the brake levers unite with the "butters" by means of a gain ; D is the center lever ; H the long rod under the car, and I the knobs fitted to the bends in rod H. p.137.

All these are parts of the *bumper brake*, and C, H and I are not used for anything else. "J is a purchase attached to the connecting rods, by which the brake may be applied by hand at pleasure, without reversing the engine." This purchase J, it must be noted, includes not only the windlass but also the chain and pulley round which the chain is made to pass. It is the only part of the whole contrivance that gives any color to the claim that this brake was ever intended for a hand brake, *and it is not claimed as any part of the improvement.* And when the specification says that the brake may thus be applied by hand at pleasure, without reversing the engine, it does not mean that it is to be used as a hand brake, but simply that this is another way of applying the *bumper brake without reversing the engine.* That is, the hand brake is applied *on the foremost car*, thus slackening its pace, the other cars crowd on it and on each other, and thus the bumper brake is applied through the whole train. That is what is meant by "*without reversing the engine.*"

What follows is conclusive on this point.

"The operation is thus: while the engine is attached to the cars, the engineer can operate on the brakes throughout the whole train by slacking the speed of his engine, and bringing it back against the butter, and so applying the power to the lever B. WHEN THE ENGINE IS DETACHED ONE BRAKEMAN IS SUFFICIENT TO DO THE WORK OF ANY NUMBER OF CARS." p. 137.

We have here two methods described of using this brake and only two, and both include the use of the bumper. In the one this result is brought about by reversing the engine; in the other, the engine being detached, the same result is effected by slackening the foremost car. In that way and no other can "one brakeman do the work of any number of cars."

We say then that all which *Batchelder and Thompson* then had in mind, all that they then supposed they had invented, was this worthless and impracticable *bumper brake*, intended in certain cases, it is true, to be set to work by hand, but none the less a *bumper brake*, and nothing but a *bumper brake* all the time.

Next as to the result. The *intended* result of the *Batchelder and Thompson* brake we have just seen; its real result was absolute failure and abandonment. According to the testimony of *Batchelder* it never was applied even to a single car; as we believe it had two trials and failed in both. It matters not, so far as this part of the case is concerned, which of these theories is correct; it is sufficient to know that the *Batchelder and Thompson* brake was wholly worthless, so worthless that even its inventors never cared to try it, or tried it twice and then abandoned it forever.

It is true that the same *Cooper* who, as examiner in the Patent Office, drew the claim for *Tanner*, and allowed the patent, and who is now brought forward as an expert to swear this case through for the patentees, gives it as his opinion that "the invention claimed in the *Tanner* patent is *embodied* in the model originally deposited with the *Batchelder and Thompson* application; it is also represented in the drawings and described and *distinctly claimed* in the original application," etc., etc. p. 106.

But in the first place no expert testimony can be received upon this point, but it must be settled by the court on an inspection of the papers and model alone; and in the second place this same *Cooper* had returned the papers "*for entire insufficiency;*" and if he did not write, he must have approved the previous decision of the office on which that letter was based, as follows:

> "The specification and drawings are very defective. The specification does not describe the nature, construction, or operation of the alleged improvement. The claim is the application to car, brakes to prevent collisions, and so forth. The claim must be clear and specific. The claim here set up would cover every kind of car brake. The drawings do not illustrate the character of the brake." p. 138, 121.

The question then is, Can such a radical change in an invention be allowed at any time under the guise of an amendment? Can it be made five years after the filing of the first application? And especially years after others have given the same thing to the public? And all with the purpose and result of forestalling these earlier and more diligent patentees, and compelling them, and those who in good faith have bought of them, to pay over again for what they cannot but regard as an unjust and fraudulent claim?

This last consideration seems to us controlling, and has always been so regarded by the courts. A delay, that might otherwise be passed over, will be fatal where others have in the meantime invented and made public the same thing. And the reasoning applies with equal force to this change in the invention. If such a change ever could be lawful, it could only be when no independent inventor had already made the same invention.

III. THIS CHANGE IN THE INVENTION, BAD ENOUGH IN ITSELF, BECOMES FAR WORSE WHEN WE SEE HOW AND BY WHOM IT WAS MADE.

This whole transaction is without a parallel. The first application was made in June, 1847. It described the *bumper* brake now familiar to the court under the name of the *Batchelder and Thompson* brake. That application was stayed by them for the purpose of making new improvements, which were never made; in October, 1850, the papers were withdrawn from the Office by *Eddy*, and after a further delay of nine months again returned without amendment, p. 139. For five years *Batchelder and Thompson, Bellows and Heath and Eddy*, kept this bumper brake in the Patent Office, and not a word do we hear in all that time from one of them as to any other. And not a word should we have heard from that day to this if it had not been for the occurrences we are now about to relate.

As early as 1847, and, as we shall attempt to show hereafter, a year earlier, one *Nicholls* invented a brake which is admitted to be the same as the *Tanner*. This brake was soon after brought into use upon the Hartford and New Haven Road, where it proved a success; but for some reason *Nicholls* never applied for a patent. p. 146–158.

In November, 1848, one *Turner* obtained a patent for a double brake bearing some resemblance both to the *Batchelder and Thompson* and the *Tanner*. It was a bumper brake, and hand brake combined. It had also a centre lever, but not arranged like the *Tanner*. This *Turner* patent was bought by *Tanner* the same who gave his name to the *Tanner* patent, and who now for the first time makes his appearance on the stage. He found it difficult to introduce this brake on account of defects we need not explain, and while travelling for that purpose, he also found the brake previously invented by *Nicholls*, as above mentioned. He must have become satisfied also that the invention of *Nicholls* anticipated that of *Turner*, for in 1851 he made a bond for the benefit of *Mrs. Nicholls*, then a widow, to secure to her a sum of money from the collections that might be made on this center lever in the *Turner* patent. About the same time he also had a model made of this centre lever, separating it from the self-acting, that is, the bumper part of the *Turner* brake, making it in all respects like what is now known as the *Tanner*, and he used this model in exhibiting the *Tanner* Patent for sale, after that patent was issued to him. pp. 536, 539, 540, 542.

In other words he threw away the *Turner* brake, and substituted the *Nicholls* brake in its place, justifying himself in this, no doubt, by the bond given to *Mrs. Nicholls*, and which he evidently regarded as a purchase from her of whatever rights she might have had under her husband's invention. Having taken this first step the rest was easy. As *Nicholls* had no patent under which *Tanner* could protect himself, he had to look elsewhere, and he had then no where to look except to the *Turner*. By a masterly stroke of policy he determined to reissue the *Turner* so as to make it include the invention of *Nicholls*. The reissue was prepared, and a claim drawn up by the same *Cooper* already mentioned. He wrote that claim, and suggested it to *Tanner* as one that he would allow on that reissue. p. 542.

Thus fortified and encouraged *Tanner* goes to Washington to obtain his reissue, but there he comes across what might then fairly be called the abandoned application of *Batchelder and Thompson*. He finds that it also is prior to the invention of *Turner*, possibly to that of *Nicholls*. Here then is another obstacle in his path, but he was equal to the emergency. He goes at once to buy out *Batchelder and Thompson*, as he had already bought out *Turner* and *Nicholls*; he obtains from them an assignment of their invention, then hastens to inform the office that he is now owner of both, the *Turner* and the *Batchelder and Thompson*, and that so there will be no need of an interference. p. 140. He is even willing to give up his reissue of the *Turner* if they will only grant the patent to *Batchelder and Thompson*, with the same claim he had already had prepared by *Cooper* for that reissue. That claim, as the court will see, was of the most elastic nature, and in terms fitted equally to any of these three brakes, the *Batchelder and Thompson*, the *Turner*, the *Nicholls*, or in other words the *Tanner*. p. 542.

A bargain is struck on this basis between *Tanner* on the one part, and the Patent Office, represented by *Cooper*, on the other; a bargain in which *Tanner* had everything to gain, and nothing to lose; the new specification is drawn with new drawings, both adapted to the *Nicholls* brake; the claim prepared for the *Turner* reissue is annexed with some slight verbal changes, and the new application is filed, all in the name of *Batchelder & Thompson*, and a patent demanded in the name of *Tanner*, their assignee. But one difficulty still remains. The old model does not harmonize with the new drawings; this new wine will burst the old bottles; thereupon the *Turner-Nicholls* model is sent to correspond with the new specifications and drawings, and the poor old model, specification and drawings of *Batchelder and Thompson*, having served their turn, are cancelled, p. 141.

The change is now complete — no one would recognize in this new applicant knocking at the door of the Patent Office the wretched abortion of *Batchelder and Thompson*.

But is this impostor to succeed? Will this court allow this so-called amendment to stand? Before doing that we beg the court to note these things. First, the *Nicholls* brake, which was precisely the same as the *Tanner*, had been invented and put in use at least as early as 1848. p. 147. Second, *Tanner* had found out the existence of this brake, and had boldly put it in place of the *Turner* into the *Turner* patent. p. 540. Third, on finding the *Batchelder and Thompson* application in the Patent Office, he repeated his former experiment, and put this same *Nicholls* brake into that. p. 140, 542. Fourth, *Batchelder and Thompson*, *Bellows*, *Heath* and *Eddy*, had kept their old bumper brake in the Patent Office for nearly five years, without a word as to the *Tanner* brake. Fifth, but the moment *Tanner* comes into the case the *Tanner* brake comes with him. Sixth, this *Tanner* brake is so infinitely superior to the old *Batchelder and Thompson* that it is difficult to believe that the same parties could have invented both, still more that they should have had this vastly superior brake lying by them all the time, and never made application for it. Seventh, *Batchelder et al.* had been trying, as they say, nearly five years in vain to obtain a patent, but as soon as *Tanner* appears, the patent is obtained without trouble.

The case of *Whitely v. Swayne*, 4 Fish. 127–8, is here strikingly in point.

"Until the year 1860 it seems to have been, if not among the lost arts, at least among the lost things of earth. The complainant, by means not proved in the case, obtained knowledge of the existence of Steadman's patent, and in 1860 obtained an assignment. What consideration, if any, he paid does not appear. It may be presumed it was merely nominal. But the complainant was doubtless aware that, though Steadman's invention was worthless for the only purpose for which it was invented, the patent was nevertheless valid, and could be assigned in law. There is no reason to suppose that complainant in procuring the assignment intended to avail himself of the machine, as a cloverseed and grass harvester. This is apparent from the fact that he has not constructed or authorised others to construct the machine since the assignment. The irresistible inference, therefore, must be—and this inference is sustained by his subsequent conduct—that his intention was to surrender the patent, and *by some artful change in the description of the machine, some additions to the devices described and claimed by Steadman, to obtain reissues enlarging the scope and operation of his invention, and thus to metamorphose the machine into a grain harvester; or, if that failed, so to change the specification as to cover certain elements and combinations then used or to be used in grain harvesters and mowers, or other machines, and thus to lay those constructing, vending or using such machines, under contribution to him as infringers of his reissued patent. If such was the purpose of the complainant, his conduct was tainted with fraud from the beginning.* And in confirmation of this I quote the following from the opinion of the Supreme court in *Brooks v. Fisk*, 15 How. 220: 'It is deemed proper to remark that the fact of procuring a patent for a new and useful machine in 1845, under the assumption of a reissue, which was not useful in 1828, for want of feed and pressure rollers now used, as alleged in defense, would present a question of fraud committed on the public by the patentee, by giving his reissued patent of 1845 date as an original discovery made 1828; thereby overreaching similar inventions made between 1828 and 1845.' "

And see what follows on p. 129.

We think then there is no doubt the patent was invalid as issued to *Tanner*. If so, it could not become valid in the hands of *Sayles*, even if *Sayles* had been an entirely innocent purchaser without notice. A fraud thus committed on the government and on the public will follow the patent, into whatever hands it may come.

But *Sayles* was not a purchaser without notice. He knew all about the transactions above narrated. He knew all about the *Turner* brake and the *Nicholls* brake. He assumed payment of the bond given by *Tanner to Mrs. Nicholls;* he was several times at her house, talking over this matter, and examining books and papers; and he promised her a handsome present in case the suit against the Hudson River Road succeeded. pp. 150, 151, 155. He knew of course all about the delay in the application, and he knew about the change made in the character of the invention, for these things were matters of record.

We claim then that, whether *Batchelder & Thompson* invented the *Tanner* brake or not, the patent was invalid; but

IV. THERE IS VERY GRAVE DOUBT AS TO THEIR HAVING ANYTHING TO DO WITH THAT INVENTION.

If the case was to be tried on the evidence already presented, we think there could be no doubt in the mind of anyone.

In the first place it is hard to believe that men capable of inventing the *Tanner* brake would have kept it back all these years, and presented only their wretched bumper brake before the Patent Office. As it is well put by *Wm. D. Bishop*, Esq., when resisting the application for an extension before Congress, "If you should go down to the seashore, and see a man bailing out a boat with a clam shell, when he had an empty bucket at his hand, you would say he was a fool; and any man of common understanding, no matter what the testimony may be, cannot believe with his eyes open, and his senses about him, that *Batchelder and Thompson* in 1846, invented the *Tanner* brake, and yet in 1847 produced the *Batchelder and Thompson* brake as their invention."

So in *Potter v. Fuller*, 2 Fish. 265, the court arguing a similar question says,

"If Bachelder" (not this Batchelder) "had previously invented and put in operation a machine that worked so well and effectively as an examination of Exhibit J. B. shows that it does, *it is inconceivable* that he should have exhibited at fairs and made models of machines with dog-fish skin rough surface, and afterward have applied for a patent for that as an improvement upon his previous patent."

In the second place, it is still harder to believe that *Batchelder and Thompson* invented the *Tanner* brake in 1846, when we find how and by whom it at last really got into the case. It is an undisputed fact that it was got there by *Tanner*, and that *Batchelder and Thompson* had nothing to do with it. Yet after this we are asked to believe that they had five years before invented the same thing. Nay more, we are asked to believe that it was their *first* invention, and that the *Batchelder and Thompson* brake came after. All this is more than an ordinary coincidence; it comes very near being a miracle. It certainly makes out the very strongest kind of a *prima facie* case against the patentees. This being so, we think every one would suppose that the plaintiff would produce all the evidence in his power to rebut it. This court will probably assume that the plaintiff has called on this point, not only *Batchelder and Thompson*, but *Bellows*, their first assignee and helper; *Heath*, who came after *Bellows*; *Eddy*, the able patent solicitor, who had the matter in hand for years, and finally procured the patent; *Tanner*, whose business it was to inquire fully into the matter from the beginning; together with such other witnesses, if any, as were knowing to the invention.

But such is not the case. Neither *Thompson*, nor *Heath*, nor *Eddy*, has ever been examined at all. *Tanner* has given his testimony, but not on this point. The only witnesses for the plaintiff are *Batchelder and Bellows*; when we read their testimony we shall perhaps see why the plaintiff did not see fit to call any more.

Bellows was a physician in Charlestown in 1846 or 7; and became part owner of the *Batchelder and Thompson* invention soon after; he paid money for it, and must be presumed to have known what that invention was. On being called by the plaintiff, and shown a model of the *Tanner*, known here as the "*Batchelder*" model, he says:

"I saw this model, *or a model representing the same double-acting brake like this*; I *think* this is the same model shown me by *Thompson* in latter part of 1846, or first of 1847; some time after I engaged to assist in making a *practical* *application of this principle* to a car on the Fitchburg Road. This brake was put on the Fitchburg car under my own observation in the fall of 1847." p. 89.

The "*Fitchburg*" model being then produced, he says:

"This model *seems* to represent *the principle* of the brake as applied to the Fitchburg car." p. 89.

On cross-examination, being asked how he identifies the "*Batchelder*" model as the one shown him in 1847, he says, "He identifies this arrangement of levers by which both sets of wheels are acted on by one windlass;" and again, "that he is positive the 'Fitchburg' model *represents the principle* as applied to the car under his observation; that he was told that models like either of those filed in the case was filed in the Patent Office, but does not know." p. 90.

It is not enough to say that this evidence proves nothing for the plaintiff; it is more in favor of defendant. We have a right to argue that this was the best that plaintiff could do. Yet this witness only swears to a "*principle*;" a conclusion of law. "*The model represents the principle*"—he identifies this arrangement of levers *by which both sets of wheels are acted on by one windlass;*" all quite as applicable to the *Batchelder and Thompson* brake as to the *Tanner*, and not tending to raise the slightest presumption in favor of either, except on the principle that being plaintiff's witness his evidence must be taken most strongly against him.

We come next to *Batchelder* himself. He, as was to be expected, swears more positively than *Bellows*, and he says that the "*Batchelder*" model is the original model made by him, that is that this *Tanner* brake was their first invention. "All that is on it now was on it when I first made it; but there was also a *bumper* arrangement put on it at the same time, which was not now on the model. The model was made from the drawings made by *Thompson* and himself in October, 1846." p. 93.

"I made another model for the Patent Office in March or April, 1847; carried it to Boston and left it with *Heath*. We tried the brake on one car on the Fitchburg road in October, 1847; after we got it arranged, we made one trial trip; it worked to our entire satisfaction; the next summer I put it on a car on the Lowell road; I only put on the hand braking on the Lowell road; on reflection I am satisfied I put it on the same as on the Fitchburg car. The model (the 'Fitchburg' model) represents the precise arrangement as it was put on to the Fitchburg car. * * I think it remained on from October to the next spring. *Thompson* wrote me he had ordered it off."

On cross examination he says that a brake like the B. & T. P. O. model was never applied to a car; that neither he nor Thompson had had any practical knowledge of railroad machinery when they set to work to get up a brake; that he has been reading his answers or some of them from manuscript previously prepared; that he explained to *Heath* their brake in all its details, and what they claimed as their invention; that stiff rods like those in the Patent Office model had been put at one time upon the "Batchelder," and also the long rod H, running under the car; that they substituted the brake patented in place of the other because they considered it much easier, cheaper and easier applied; that *G. B. King*, master mechanic of the Lowell road, had sworn, in the case of *Sayles v. Phil.*

& Bal. Road, that the brake, as applied on the Lowell road, was put on with large rods as in the Patent Office model, and that, on applying for leave to try their invention on the Fitchburg road, they showed him the "Batchelder" model, *which was then arranged like the Patent Office model.* p. 96–104.

Being asked whether he had been made to understand that he must fix the date of his drawings not a month or six weeks later, and that the brake must be complete in all its parts as seen in the "Batchelder" model, or his evidence would be of little use to the plaintiff, he replies, "I have no *recollection* of any such thing." Again, being asked whether much of his evidence had not been framed for him by the plaintiff, instead of giving it a flat denial, he says, "I think I am capable of acting and speaking and thinking for myself." p. 103.

Finally, while attempting to explain this mystery, the very thing he most carefully avoids is that which most needed explanation. What we want most to know is, how it happened that they kept the *Tanner* brake in reserve from 1847 to 1852, and then brought it out just as *Tanner* came into the case. Did he propose the change, or did they? How was *Thompson* induced to give up his bumper brake? We would have liked to know the conversation that took place when *Tanner* and *Batchelder and Thompson* first came together; how they satisfied *Heath*, and what explanation they gave to *Eddy*. But all this is a sealed book. *Batchelder* has forgotten "how he expressed himself to *Tanner*," and no one else is here to tell us.

Now the question is, Is this evidence of *Batchelder* enough to overcome the *prima facie* case above presented? We insist that it is not: because he is an interested party; because some of his answers, we cannot tell how many, were prepared for him in manuscript, while others are evasive; because he is not corroborated by *Thompson*, or *Heath*, or *Eddy*, or *Tanner*; and because he fails to explain the most essential fact in the case.

Again he admits that the brake shown to *Turner*, master mechanic of the Fitchburg road, was the same as the old *Batchelder and Thompson* bumper brake; though, as actually put on, he would have us believe it was the *Tanner* brake, p. 102.

Again, if the *Tanner* brake was in fact put on one car on the Fitchburg Road and also on the Lowell Road, and "worked to their entire satisfaction," why was it never applied on any other car on either of those roads? Why did both those roads go on using the single brake on all their other cars till 1851, and then adopt the *Hodge?*

The court below, speaking of the alleged prior use of a double brake on the Camden & Amboy Road, insists that such a thing is well nigh impossible: "If it were true that a double acting brake of the kind included in the model of the John Tyler car existed in 1843, *it is scarcely possible to doubt that it would have gone into general use at once on the road*," p. 67.

We do not agree with this reasoning, for that is not the way improvements are made on railroads; but as the argument was thus used against us in another part of the case, we are entitled to use it here.

Finally if *Batchelder and Thompson* really invented the *Tanner* brake in 1846, why were *Tanner and Sayles* still so anxious in 1853 to placate *Mrs. Nicholls*, as it seems they were from their promising her a present in case the Hudson River Railroad suit was decided in their favor, and from *Tanner's* letter of Nov. 11, 1856? p. p. 150, 155.

We insist then that the patent is void for the delay in following up the application; if not for that, then for the change in the character of the invention; if not for either or both of these, then because others had in the meantime invented and published the same things; if these still are not sufficient, then because of the manner in which this change in the invention was brought about. There is not one of these reasons but what seems sufficient, but we need not rely on any one of them alone. It is the cumulative weight of all these facts together to which we especially invite the attention of the court.

II.

THE QUESTION OF NOVELTY.

We next insist that Batchelder and Thompson were not the first inventors of this brake; and to prove this, present four prior inventions. The *Millholland Brake* — The *Stanley-Talson* — The *Camden and Amboy*, and the *Nicholls*,

I. THE MILLHOLLAND BRAKE, pp. 79–86, and 158 to 167, was applied by James Millholland on the Baltimore & Susquehanna Road as early as 1845.

In place of the Tanner center lever it had a drum under the bottom of the car, with four rods running to it by which all the brakes could be applied at once from either end as in the Tanner — the drum performing all the functions of the lever. It is not quite clear how long it was used; it may have been a year or only a few months, but if the same as the Tanner this is not important. That it was substantially the same as the Tanner can, we think, be readily made to appear. The invention in the Tanner patent is the means employed to connect the two sets of brakes. "What we claim is to so combine the brakes of the two trucks with the windlass *by means of the vibrating lever A or its equivalent*," etc. The trucks, the brakes and the windlasses were the same as in the old Single Brake; all that was done in the Tanner was to add this centre lever and make the necessary connections. But the Millholland drum is the full equivalent of the lever. That lever is only two spokes of a wheel, and a wheel is only a shorter drum. Then as to the four connecting rods of the Tanner they are all found without any change in the Millholland. If the Millholland had come after the Tanner, it would clearly have been an infringement. Or if Millholland had obtained a patent, as he certainly might have done, with a claim for "combining the two sets of brakes by means of the oscillating drum or its equivalent, so as to apply all the brakes at once from either end of the car;" can there be any doubt that the Tanner Brake would have been an infringement? And would it have required any invention to substitute the lever for the drum?

But the fact that he never got a patent makes no difference, neither does the fact that it was abandoned. *Many v. Sizer*, 1 Fish. 21; *Colt v. Mass. Arms Co.*, Ib. 115; *Case v. Brown*, 2 Ib. 272; *Rich v. Lippincott*, 2 Ib. 7, 8; *Whipple v. Baldwin Man. Co.*, 4 Ib. 32; *Evans v. Eaton*, 1 Pet. C. C 323.

> "We must distinguish between the invention and the machine. The invention may be perfect, and the machine imperfect. If the prior machine was identical in invention it is immaterial though it required more adjustment of parts or mechanical perfection to make it work as well as the plaintiff's." *Amer. Hide and Leather Split. and Dres. Mach. Co. v. Amer. T. and M. Co.*, 4 Fish. 306, 7.

It is said, indeed, that the drum is rigid and unelastic, and has no effect to increase the power. But it is no more rigid and unelastic than the lever; it is absurd to talk of a bar of iron two feet long and three or four inches wide being elastic in the direction of its width; and as to multiplying power, the lever will not do that any more than the drum if the rods from the brakes run to its extreme ends as is sometimes the case; but no one would think of claiming that it was any the less the Tanner lever on that account. Moreover the drum can be made to increase the power as well as the lever and in the same way, viz., by attaching the brake rods nearer its centre, as shown in Fig 12.

Or leaving the drum just as it is, we can obtain all the power we want by simply restoring the brake levers found in the old Single Brake. The trouble with Millholland is not in the drum, it is in the trucks. And surely after Millholland had invented this drum, after he had shown how the two sets of brakes could be combined, there could be no invention in substituting for his truck-levers the well-known arrangement so long used in the Single Brake. The defects in the Millholland had nothing to do with the drum, the particular part in question, and those defects therefore ought not to be regarded. *Pitts v. Wemple*, 2 Fish. 10.

II. THE STANLEY-TALSON BRAKE, pp. 289–303, was applied on the New Jersey Railroad and Transportation Co., in 1842. It had a centre lever, the same as Tanner's; but the arrangement in the trucks seems to have been somewhat different. To simplify the case we admit that it was used only a short time, and was abandoned. For this various reasons are assigned. One of plaintiff's witnesses swears that *Talson* said to him that

> "He claimed it operated precisely like the *Tanner*. I recollect asking him this question; if it operated precisely like the *Tanner*, why it was subject to these break-downs; why it should break when operated, as the *Tanner* was not subject to do? His reply was, that it was because it was not properly constructed; that the materials were not of sufficient strength, and that in applying new machinery you could not always tell what particular strength to give particular parts—and that it was an experiment."

Another witness says when asked what was the trouble with it: "It appeared to be light, so that it would break."

Acting on this view of the case the plaintiff claimed that this brake was an abandoned experiment, and as such could not defeat the patent. Much of the argument in regard to the *Millholland* Brake applies equally here. In addition we suggest first, that nearly all the difficulty in which this class of questions is involved is due to the ambiguous use of the word "*experiment.*" There are two kinds of experiment. One is where attempts are made to produce the machine, but without success. There is no doubt that this class of experiments is not sufficient to defeat a patent. The other class is where the machine is produced, but owing to its weakness of material, or some mistake as to size or proportion, it breaks or fails to do good work.

Now if we apply the same rule to this class of experiments, and follow out that doctrine to its logical results, we shall find ourselves involved in gross absurdity. Thus, suppose A to invent a revolving pistol which on being tried bursts, because the iron is poor or too thin, or because the parts wanted nicer adjustment; and suppose he makes his invention public; will it be pretended that B can obtain a patent for that identical pistol, simply by making it of a little thicker or better iron, or by a more careful adjustment of parts? Yet if it is an abandoned experiment in the proper sense of those words, there is nothing to prevent. Nay more, he may even obtain this patent though he has full knowledge of all that had been done by A, though he has stood by and watched all his operations. For the law presumes the inventor to have full knowledge of all that had been done by others before him.

And whether he knows of these prior attempts or not, if they are abandoned experiments, they go for nothing. In short, an abandoned experiment is to all intents and purposes the same as though it had never been. Hence it follows, to take this very case, that the parties who stood by while *Talson* applied his brake, might any of them have obtained a patent for it, simply by making it strong enough for its work. Whereas, if *Talson* had never made a brake, if he had never taken the first steps towards it, but had contented himself with showing how to make it in a printed book, it would have been impossible for any one ever after to obtain a patent for it, thus showing that the pen is not only mightier than the sword, but better than a whole chest of tools besides.

It seems to us that no better rule in such cases can be found than this: If the prior inventor has gone so far that a printed description of his machine would suffice to defeat a subsequent patent, he has done enough. His work may be only by way of experiment, he may never give it more than a single trial, or he may never try it at all; he may then and there abandon it, no matter for what reason; still, if he has made it public, it is enough — no one else can after that obtain a patent. We thus produce entire harmony between the two provisions of the Act. And certainly Congress never could have intended that a thing merely described in a book should have any greater effect than the same thing actually done.

We know there are cases which, read literally, and without regard to the facts, give a different view of the law. But in most, perhaps all, of those cases, the prior machine was either never completed or was not on the same principle as the patentee's. We think no case can be found in which a prior machine was held insufficient to defeat the patent, simply for want of strength.

In *Jones v. Pearce*, Web. Pat. Cases, 124, cited by plaintiff, one of the questions left to the jury was whether the prior wheels were constructed and operated on the principle of plaintiff's invention. On this point there was conflicting evidence. Curtis on Pat. § 89. There is nothing in the case to intimate that if *Strutt's* wheels had been the same as plaintiff's, and had been used a year they would not have defeated the patent, except the implied instruction that such use must have continued up to the date of the patent, which certainly is not the law.

In *Galloway v. Bleaden*, Web. Pat. Cas. 521, the case turned on the question whether "the subject of the patent was the very discovery which the prior inventor had himself made," p. 528. And on page 526 the court says to the jury, "The question you are to determine is whether on the evidence the thing itself was complete, so as to be used, or whether only a series of experiments were going on."

In *Household Co. v. Neilson*, Web. Pat. Cas. 708, the court below had ruled that the prior use must come down to the time of the patent; that the use even of machines of the same sort, if abandoned, would not be sufficient. But this was held to be error, and the Lord Chancellor says, "I never heard it before questioned that the notorious public use of the invention before the granting of the letters patent, though it may have been discontinued, is sufficient to invalidate the patent." And the judges all agreed that if the invention be perfected, "the abandonment becomes wholly immaterial," which is precisely the doctrine we are here contending for.

The true rule on this subject seems to be laid down in *Marshall v. Mee*, Dunlop, J., Law's Dig. 314. "An imperfect and incomplete invention resting in mere theory or an intellectual notion, or in uncertain experiment, and not actually reduced to practice, *and embodied in some distinct machinery*, is not patentable under our laws." And so *Winans v. Danforth*, Nelson J., Law's Dig. 603.

Another very proper test is one already noted under the *Millholland*. Has the first inventor gone far enough to entitle himself to a patent? If he has, and makes his invention public, certainly no one else can have a patent. But there can be no doubt in this case that *Talson* might have had a patent. Nor that the *Tanner* brake would have been an infringment of that patent. This is the test applied in *Allen v. Hunter*, 6 McLean, 321.

If we accept this test it is conclusive. For if *Talson* could have had a patent *Tanner* could not. *Talson* did not abandon his invention to *Tanner*, but to the public. It is not like the safe case, where the invention was known only to the inventor. The use of Talson's brake was open and notorious and known to many.

That this use was for a short time only, can make no difference. *Bedford v. Hunt*, 1 Mas. 305; *Watson v. Bladen*, 4 Wash. 583; *Rich v. Lippincott*, 2 Fish. 7; *Parker v. Ferguson*, 1 Blatch. 407.

In this case a witness stated that he made a wheel embracing the principle of the plaintiff's invention; it was caried away and he never saw it again. Held by Nelson, J., sufficient to defeat the patent, without proof that the wheel was ever actually used.

III. THE NICHOLL'S BRAKE; pp. 146–158, was the same as the *Tanner*, and was used successfully for years. The only question is as to the date of invention; and as to this the evidence is brief. The principal witness is *Mrs. Nicholls*, now Mrs. Allen. p. 148. Her testimony is remarkably minute and circumstantial, and bears all the marks of truth. If she is to be believed her husband made his first drawing of the brake in the spring of 1846, and applied it on a car previous to May, 1847. He would thus anticipate *Batchelder and Thompson*, who, made their drawings in October, 1846, and did not apply their brake till October, 1847; p. 93.

The court below says on this point, "But I think the weight of the evidence is that the *Nicholls* brake was not invented until the spring of 1847, and was not applied until 1848. We have constantly to bear in mind, in weighing the testimony of witnesses who speak of circumstances occurring many years ago, the liability to mistake the particular year, unless they have some evidence of a documentary character, or otherwise, or some leading fact as to which there can be no error, upon which they may rely to show the particular time. This brake was applied upon what is termed a long baggage car. The witnesses, *Stockbridge* and *Fields* state that this car was not finished till the spring of 1848. Various other witnesses differ as to the time from *Mrs. Nicholls*; and she differs now herself in giving her deposition from what she stated in the case in New York some years ago. Besides she took an account book to *Fields*, and inquired of him as to the time her husband put on the brake, which shows that she really had no memory as to the time," etc. p. 64.

With all respect this seems to us a little unsound. For first, as to the liability of witnesses to mistake the year, etc., this applies just as much to plaintiff's witnesses as to *Mrs. Nicholls*. They produced no "evidence of a documentary character—nor any leading fact as to which there can be no error," any more than she; in fact, not so much; for she fixes the time when she went out at her husband's request to see the brake in operation in a way that every woman, or every woman at least who has ever been a mother, will fully appreciate. The court would seem to imply that the long baggage car, on which the brake was applied, was "evidence of a documentary character," or a "leading fact as to which there can be no error;" but that car was no more a leading fact than the brake itself, and not a tenth part so leading as the child *Mrs. Nicholls* then carried in her womb.

Again, the court below seems entirely to have overlooked the fact that this brake was first applied, not on this new large baggage car, but on an old baggage car the year before; p. 156, at bottom.

Again, *Fields* does not state that this car was not finished till the spring of 1848. What he does say is that "*Nicholls* had such a car built, *but I couldn't tell when it was finished;* I should *think* it was finished in the spring of 1848—*to the best of my judgment; cannot tell positively;* I worked on the car considerable; *think* I worked on it in 1847, and 8; *think* some of the work was done during the last year I worked there;" p. 133.

Stockbridge does state positively that he commenced work there April 1, 1848, under *Nicholls;* after he had been there a short time *Nicholls* directed him to apply a double brake to a new long baggage car. But he does not state how new this car was, nor whether that was the first time the brake had been applied to it, nor whether the brake had not been previously applied on another car. But he does say that he has a faint recollection that some of the men said it had been previously applied, and taken off, on account, he thinks, of its not working well. p. 126.

And what is equally noticeable, he says not a word about *Fields*, but tells us that he himself put on this double brake; while on the other hand *Fields* says nothing about *Stockbridge* except that he recollects he was there when he (Fields) left; but says that the brakes were altered several times, and he recollects taking them off once himself. p. 134.

But the court says again, "Various other witnesses differ as to the time from *Mrs. Nicholls*," p. 64. The only other witnesses are *Leppens* and *Hebard;* and they, instead of differing from *Mrs. Nicholls* as to the time directly confirm her. *Leppens* swears that he became acquainted with *Nicholls* in March, 1846; that they built this long baggage car in the fall of that year, and attached to it the *Nicholls* brake; and that this car with the *Nicholls* brake attached, was running as early as March or April, 1847. The brake was applied in three different ways. It is true, he does not remember *Nicholls* showing him the drawing as stated by *Mrs. Nicholls*, and he *thinks* it wasn't more than three months before the brake was applied to the car that *Nicholls* explained to him his invention; he also says that when *Nicholls* showed it to him, he spoke of it as an invention he had just got up. p. 147.

But no one supposes that this invention was got up by *Nicholls* in a day. He had conceived the idea in the spring of 1846; had made various drawings of it during that summer; had finally settled upon the form he liked best, and in that form applied it to a car, first on an old baggage car, and then on this new car. And after putting it on the car he continued to try it, with various slight alterations in the hooks, the length of the centre lever, etc., till all these details were arranged to his satisfaction.

Hebard, the only other witness makes all this perfectly plain. He began work for the Hartford & New Haven Road in August, 1845; and in April or May, 1846, "agreed" with *Nicholls*, then foreman of the car repairs. "I can't tell the time when we commenced talking about the arranging of a brake, but it was during the winter of 1846–7." He then goes on to describe how he, under the direction of *Nicholls*, made and applied the brake. It was first applied to *an old baggage* or passenger car; and there were repeated alterations as above shown. This was in the winter, the writer says again, of 1846–7. During all that winter we were at work on *a new baggage car*. These new brakes which Mr. *Nicholls* ordered made were *put on this new car*. There had to be a new centre lever made. This new brake was perfected on this new car. p. 156.

He left the road late in the fall of 1848; and then this brake was on two passenger cars, and this new car, and was put on baggage cars as they were repaired. "I remember perfectly the appearance of Mr. *Nicholls* the first time he tried the brake in bringing up a train. It was early in the spring of 1847, or the spring after I done the work. My impression is it was pleasant weather, but cold; he had an overcoat on, buttoned up. It was his triumphant look that impresses it upon my mind." p. 158.

Being afterwards called by the plaintiff, and thus made his witness, he says:

> "I testified that it was my impression that it, *the new baggage car*, was finished in the spring of 1847; my impression is the same now. I know of nothing to vary it; I have nothing to fix the date as to when the car was finished; I can 't fix the time when the car was finished any better than the time when *Stockbridge* commenced; to the best of my belief that car was built in the winter of 1846 and 1847. I can 't be positive but I think it was finished in the spring of 1847." p. 125.

Now if we admit that this witness is too uncertain to be of much value as to the time, and set off that part of his evidence against the plaintiff's witness *Fields*, who is yet more uncertain, we shall have two witnesses, *Leppens* and *Mrs. Nicholls*, to offset one witness *Stockbridge* — and the two witnesses who knew more about this matter than any others.

But it may be said *Stockbridge* cannot be mistaken as to the time, because he swears by the books. But why cannot a witness be mistaken as to what is contained in a book as well as about any other fact? If indeed he had produced the books, or if he had even told us what was contained in the books, or when if ever he had consulted the books, it would be different. But he tells us none of these things. This evidence then is purely hearsay, and incompetent, because the books were not produced. If the books had been produced, it might at once appear that the witness' statement was merely matter of argument; that the books did not in fact show when he first went into the company's employ, but simply contained some entry from which he inferred that fact; for aught we know, the witness might not have seen the books for years, or never seen them at all, but based his statement on what had been told him by others. And yet on this scrap of wholly incompetent testimony we are asked to reject the minute and detailed statements of *Leppens* and *Mrs. Nicholls*, either of whom had more knowledge of this matter in their little finger than *Stockbridge* in his whole body. We must remember, too, that all Stockbridge speaks about is the new car; he says nothing of the prior application of the brake.

But the court below says further, that "*Mrs. Nicholls* differs now herself in giving her deposition from what she stated in the previous case in New York." p. 64.

This is true. and it would be strange if it were not. But the question is, Are these differences essential; are they such as to destroy or weaken our confidence in her testimony? There are two points in which her present testimony differs from her former. She now says that her husband began on his drawing of the brake in the spring of 1846; that he showed it to *Leppens* at that time, and that the car came out with the brake attached in the spring of 1847. On the former trial she is alleged to have said: "I know of my husband drawing a plan of a brake for cars; I should think he drew that plan in the fall of 1846; that was a double brake, as he called it; I know of his going off on a train of cars to try a brake after this; I can 't tell the time. I think it was before March 1847. * * My husband was sick in March, 1847. I think the brake was applied before that; he was sick most of the time till June, 1847; he left home in June, 1847; he had been sick some two months before; he was unwell at the time he invented it. I don't recollect any circumstance that would show the date more certainly; to the best of my recollection it was in 1846, late in the fall; it was quite cold weather; that drawing was made at night, I was fearful of his injuring his health by sitting up at night; he was more unwell after that till he was confined to his house. I am not able to fix the time."

Now first, the principal fact, or the public trial of the brake on a train of cars, is fixed in both her statements at the same date, in the spring of 1847. Second, there is no such discrepancy as to the time of making the drawing as to throw any doubt on either statement. Our theory here is that *Nicholls* conceived the idea and began on his drawings in the spring of 1846; that he had it far enough advanced to show it to his wife and *Leppens* at that time; but that he continued to work on and develop it until it was finally brought to perfection. There is nothing forced or improbable in this theory; on the contrary that is the very way we should expect the thing to be brought about. We thus reconcile both her statements, without doing violence to either.

But again, her testimony on the first trial was very short, and no opportunity seems to have been given her to go into details, and thus refresh her memory, and at the same time prove its correctness; it was in open court, and she was as she herself tells us very much confused and bewildered; whereas in the present case her testimony was taken in chambers, without the noise and hurry and publicity of a jury trial; she had had ample time to think the matter over, and then to give her testimony with that fulness of detail that clearly proves the correctness of her recollection; in short, we think no unprejudiced reader can compare her two statements without being convinced, either that there is no contradiction or else that the last one is correct.

The court below says further,—

> "Besides, she took an account book to *Fields*, and inquired of him as to the time her husband put on the brake; which shows that she really had no memory as to the time."

Is this a fair conclusion? Suppose two judges of this court, for instance, were to be called as witnesses to a matter that happened fifteen years ago, and one of them should go to the other to ask as to his recollection, would it be fair to argue from that that he "really had no memory about it?" Is it not, on the contrary, what every one would naturally do?

We submit then this testimony of *Mrs. Nicholls*, confirmed as it is by that of *Leppens*, as decisive. No one can read that testimony without feeling that the witness is seeking to tell the truth. Her going to *Fields* adds but another proof of this. That she knew when her own child was born, in June, 1847, and that her condition for some months previous must have been connected in her mind with her going out on the piazza to see her husband go by triumphant with his train of cars, controlled for the first time by his now successful invention, so that she could not think of one without remembering the other ever after, seems to us so natural and unavoidable that we wonder any one can be found to doubt it.

Finally, the court will remember how anxious both *Tanner* and *Sayles* were to secure the good will of *Mrs. Nicholls*; how they promised her a handsome present in case that first suit were decided for the plaintiff; and how even after that, and as late as 1856, they still sought to propitate her; pp. 152, 155; 147; 540. But why were they so much interested in *Mrs. Nicholls*, and why did they thus seek to affect her testimony, unless it was because they believed the invention of *Nicholls* to be prior to that of *Batchelder and Thompson?* And we suggest in conclusion, that if the court should find the testimony somewhat conflicting, it should not incline in favor of that party who has used such means to obtain a verdict.

IV. THE CAMDEN AND AMBOY BRAKE, p. 168–635, was the same in all respects as the *Tanner*. We say it was applied on a passenger car on the Camden and Amboy road in 1843, and on a crate or baggage car about the same time. Appellee insists that no double brakes were in use on that road until 1851, when the *Hodge* brake was adopted. The question, then, is one of fact—Was there a double brake on a car on this road as early as 1843, or before 1851?

The car on which this brake was used was one well known as the "Tyler Car," President Tyler having traveled in it on his way to the Bunker Hill monument celebration in 1843. It was distinguished from all other cars on the road by having twelve wheels instead of eight, by its springs, its seats and its superior elegance. The importance of this is manifest. This car being better known than any other, if the defendants' witnesses were mistaken, their mistake could be readily shown. And if a fraud had been intended, this Tyler car never would have been selected, but on the old maxim, "*fraus latet in generalibus,*" the parties would have alleged a use of the brake on a car of the same general style as all the rest. With this single suggestion we pass to the testimony, taking up first the appellant's, and then the appellee's.

1. Edwin Lockwood, p. 168, was master car builder of the C. & A. road for thirty years. He says, "I have made a great many experiments in brakes in various forms; I tried brakes by clamping the wheels on both sides, on four wheel, eight wheel, and twelve wheel cars. I have also tried experiments with brakes by applying a block on the rail between the wheels, etc. We finally adopted a cross-lever brake attached to the body of the car, and the trucks attached to that, in the form shown in the model A. We put the brake on the car from the first of May to June 10, 1843, and the car was put on the road at that time, and conveyed President Tyler on his tour east to the celebration of the Bunker Hill monument. The car was ever after called "John Tyler," by lettering it on both ends inside. We also applied it to a crate car for baggage, which was put on directly after that.

2. Geo. W. Thompson, p. 179. Saw the Tyler car in June, 1843, at the time of the President's tour; it was thought to be the greatest car in the United States; he furnished all the trimmings for it, and did the work himself. While so employed he noticed the brake; it was like model Exhibit A.; his attention was called to it by the men in the shop; the same brake was on the car when he trimmed it again in 1849. "*Lockwood* asked me if I understood about the brakes (I didn't know then that there was any trouble at all.) I told him I recollected distinctly, that the brakes operated from either end of the car, and hung in the center, and that it was the first I had ever seen." He had also seen such a brake on a crate car previous to 1847.

This witness has been mayor of Bordentown six different terms, and also a member of the legislature; his attention had been particularly attracted to the Tyler car because of its elegance, and the President's tour, and also to the brakes. It is not easy to believe him dishonest or mistaken. According to appellee there was no double brake on the road till 1851, but *Thompson* says he saw it on this car in 1843, and again in 1849.

3. N. F. Smith, p. 183, went into the employ of the C. & A. road Dec. 19, 1845, as appears by the books of the company, which he produced, at repairing cars. A few days after he was set to work with one *Vandergrift* to take out the trucks of the Tyler car. He had to go under the car to unhook the brakes before they could get the trucks out, which is not necessary with a single brake. It was a double acting brake, as near like model A as I can recollect; it was the same thing. Sometime after, in the winter of 1845–6, a crate car came in the shop to be repaired with the same brake on as model A. At the time he saw this

brake he asked the men how it was different from the others, that is, the single brake, and they said it was an improvement on the single brake.

The only question here is, could the witness have made so great a mistake as to think he saw this double brake and made these inquiries about it a few days after he went into the Company's employ in 1845, if he really did not see it till six years after, in 1851?

4. L. Cox, p. 187, has been in the employ of the C. & A. road since 1838, as car builder and repairer. In 1847 I saw a double brake on a crate car that came to Amboy; it was connected in the centre by a cross-lever, with a rod running from it to the brake lever, and another rod from the centre lever to each end of the car, attached to an upright shaft on each end of the car, etc. It was like model A, and applied the power to both trucks at once, from either end. I fix the date by the age of my son, who was born Feb. 27, 1847. I was at work on the brake, and was called off to go for the doctor. I had seen such a brake before at the Bordentown shop, on a car afterwards called the John Tyler; she was not named then. I am positive the brake on that crate car could be applied to all the wheels at once from either end. What called my attention to the brake was one of the rods being broken. It was the rod that connects the centre lever to the lever in the truck.

5. Wm. Venable, p. 190; began work for the C. & A. Aug. 28, 1843. June 10, 1843, I saw President Tyler pass through Bordentown on his tour; I recollect of his being in a certain car that was afterwards named "John Tyler." I did not know at that time what kind of brake was on that car. I think in the latter part of 1844 I was called to repair the trucks and brake of that car, and I noticed the cross-lever attached to the body, more particularly because of its being connected with an upright lever attached to the truck; it was necessary therefore to unconnect the rod attached to each lever in one truck, that the trucks might be taken out from under the car. I mean the upright lever in each truck. I disconnected it at each end of the car. I know of the use of this brake on a crate car before 1847. I recollect other double brakes on that road; the *Stevens* and the *Hodge;* to the best of my knowledge and belief they were not tried before 1850.

Here again we ask could the witness confound 1844 with 1851? And if it was 1851 why should all these witnesses have so much to say about the Tyler car, and the crate car alone, when we know that in that year the *Hodge* brake was generally adopted?

6. Charles Yundt, p. 199; was engineer on the C. & A. from 1840 to 1856. Ran excursion trains in 1843, 5 and 6, to South Amboy. In July or August, 1845, his train had to stop, owing to the breaking of a brake rod, two or three miles beyond Hightown. It was a brake like Exhibit A. The bolt came out of the rod attached to the end of the cross-lever, and I had to put another bolt in, and put the rod back in its place. This is the only time a rod fell down in my trains. *William Crim* was brakeman. These excursion trains didn't run after 1846. I was married in 1844, and didn't run any that year, and in 1845 and '6 I run them. I got my clothes all dirty going under the car, and my wife asked me what was the matter when I got home, and I told her.

This has all the marks of truth, and is strongly corroborated by others.

These excursion trains were running in '45 and '46, and they did not run after that, and the Tyler car ran in them.

7. **Wm. Crim**, p. 205; was *Yundt's* brakeman in 1845 and '6, and was with him when the rod fell down, as just shown. The brake was like Exhibit A. It was the rod as the car was going ahead, that fell and dragged on the ground; it made a great rattle and dust. Never knew of the brake rods falling at any other time; they afterwards put up iron straps to prevent their falling in case they broke; in 1845, I think, I know of my own personal knowledge that there was in use on the Tyler Car in '45 or '6, a double acting brake like Exhibit A. They had it on other cars in those years. I could not pretend to say how many. There were two that I know of.

8. **R. C. Walcott**, p. 207; Feb. 26, 1848, took the place of Joseph Cox as engineer on the C. & A. road; Cox having been killed the day before, as proved by his tombstone. He remembers the use of a double acting brake on that line about the time of taking that train; and substantiates it by a minute statement containing all that detail peculiar to this class of witnesses. He also states that this occurred when *Van Rensellaer* was superintendent; which leads appellee to say, in showing up our "contradictions," that "*Van Rensellaer* was called, and he swears he *was not on the road at the time Walcott names*."

But *Van Rensellaer* really says "I was appointed assistant superintendent in '49 or '50, I can't tell which; and continued to act in that capacity till I was appointed superintendent in '55 or '56, I think; *I can't say that either of these are positively correct*."

9. **John H. Jobes**, p. 210; has been brakeman on the N. J. R. & Tr. Co. 32 years. Remembers a double truck car belonging to the Cam. & Am. road, came to Jersey City between '43 and '49 with a double brake on it. The first that called my attention was they said a car had arrived there with a double-acting brake on it; the reason why I took more notice of the brake was that I was a brakeman and had a great deal of breaking to do. I was very anxious to get them put on the car that I was breaking on at the time; the brake, if my recollection serves me right, is what they call a double-acting center-lever brake. If I had not seen the brake from the time I first saw it until the present time, I should have known the brake by the drawing. Exhibit A is the same as near as it can be drawn. I got under the car to see the brake; I had never seen one of the kind, or one work before, and was very anxious to see the movement of the brake.

Being recalled, he says: I know that during *Mr. Talson's* time I was then brakeman on the Newark train; I was transferred to the Philadelphia train. I there found a double-acting brake on a flat car; I mean by a double-acting brake one with a center lever acting upon eight wheels at once; I used that brake on the Philadelphia line; I used it probably two or three years; I can't state the exact length of time. I can't state any further than that it was in *Mr. Talson's* time.

10. **J. S. Gamble**, p. 289; is in the auction and commission business at Newark. Was conductor on the N. J. R. & T. Co. from '37 or '38 to '47 or '48. I think it was '47. As near as I can recollect, a double acting brake was applied some three years before I left the road; as far as my knowledge extends, was on the road when I left; the operation of that brake was different from the one we had formerly used, inasmuch as it broke upon both trucks at once, and from

either end of the car, and upon all the wheels. *John H. Jobes* was our brakeman at that time. I left the road Sept. 1, 1847. There was a lever in the center under the platform car to which this brake was applied, with a rod running to and connecting with the brakes on the trucks at each end, and connected with a windlass at the same time. I know by personal observation how the operation was, by the application of the windlass the brakes bore upon all the wheels of the trucks. This was a platform car; some might have called them crate cars. This was the only brake to which my attention was particularly called; my brakeman, *Mr. Jobes*, called my attention to it, and said it was a very desirable brake, and worked nicely; it was something new. The men spoke of it as a new thing. There is no doubt at all in my mind that there was a double brake on the platform car of that road which operated from either end of the car.

11. George W. Fielder, p. 298; is a produce commission dealer in New York. Went into employ of the N. J. R. & T. Co. in spring of 1845, and left in spring of '48. Remembers hearing a brake talked of among the men when he first went there; it was the *Stanley*, as he recollects; always supposed *Talson* had simplified and got up that brake, which was used on the car spoken of; I don't know this positively. This single center lever brake was on a platform car, and was used, my recollection is, by a man named *Jobes*, a portly man. I havn't seen him since. I couldn't say this double brake was in use on said platform car all the time I was there, but think it was most of the time. I saw it as often as I saw that train come in or go out from the Jersey City depot; how often I could not give any idea. I found this brake on the road when I commenced work there.

This evidence, taken in connection with that of *Gamble* and *Jobes*, is very convincing. *Gamble* left the road Sept. 1, 1847; this brake, therefore, must have been there before that time, and as he swears, as early as 1844. *Jobes* is sure it was in *Talson's* time, and *Talson* left in August, 1849. p. 303.

12. Thomas Herbert, p. 211. Began work for the C. & A. in 1844, at Bordentown; and in July, 1847, was sent to Camden. In 1846, I think, the Tyler car came on there [to Bordentown] and me and my father put a pair of wheels under her. In the latter part of '46 *Mr. Lockwood* took me from repairing to go in the shop, with *Charley Vandergriff*. I went to *Charley*, and told him the boss sent me there to help fix the trucks, and run them under, and let this passenger car down on the trucks. The brake was a double brake, which we put on the car; it had a cross lever in the centre of the car—connected with this lever were four rods, one lever or rod on the right, running to a post at the end of the car on the platform, another one connected with that about four inches back from the rod, etc. It was the same as Exhibit A. There was the same kind of a brake on when I and my father put the pair of wheels under. After I went to Camden in '47 there was one on a crate car, and I think on a passenger car.

The time here is fixed beyond doubt: it was while he was at Bordentown, before he went to Camden. And it is shown by several other witnesses that this *Charley Vandergriff* was repairing cars at Bordentown at that time.

12. B. L. Wolcott, p. 215; was married April 13, 1845; a few weeks after began firing for Yundt, and fired for him 11 months, partly on these excursion trains. In going down the cut two miles this side of S Amboy, the engineer went to reverse his engine, and something broke, so that he lost con-

trol. There was a man on the engine with us, by the name of *Wm. Sharp;* he and I went over the top of the cars to put the breaks on. I went right to this Tyler car first, and put the break on. My reason for going there was because it had a double brake. The double brake held on both trucks, and all the other cars between had only one brake, that held on one truck only. That brake was like Exhibit A, as near as I could explain it, and is in use now on the C. & A. road. I had noticed the brake on the Tyler car before, when they took President Tyler over the road. August 3d, 1844, my father died; the night before I slept in the Tyler Car, which I had been cleaning. I know there were double brakes on it then. We were all in danger of our lives at the time the engine gave out, and I think I have not been through that cut three times since without thinking about it. I stopped firing early in 1848. I was firing for *Joseph Cox* when he was killed. There was a crate car in the train with double brakes. I had to drill the train; [that is, get the train into place after discharging the passengers.] I used to cut this crate car loose and let it down into the pit pretty much every day, to save time.

This *Joseph Cox* was killed Feb. 25, 1848, as proved by *R. C. Wolcott*, who took the date from his tombstone, p. 208. Now, taking all this together, it seems impossible to explain it on any other theory than its truth. Appellee has shown the great importance he attached to it by the length of the cross-examination, in which he has sought to show that the witness was mistaken as to the time and place; but has only succeeded in proving still more clearly the fullness and accuracy of the witness' recollection. Failing in this plaintiff next sought to show that the Tyler car could not have been in an excursion train in 1845.

"But another of defendant's witnesses, Head," says the plaintiff, "swears that from and including 1845, and for four years afterwards, he was depot master at Tacony, and had the "Tyler" car under his charge there all the time, and he names the trains she ran in during those years, and proves conclusively that during the whole period she ran in only two kinds of trains, mail trains *running to Jersey City*, and the '*Trenton way train,*' *not going beyond Trenton*; while *Wolcott* says the circumstance he referred to occurred near *Amboy*, which is a *terminus* of the Camden and Amboy road, more than forty *miles* from Trenton, and across the Raritan Bay from Jersey City, which is on the *New Jersey* road, and not on the Camden and Amboy at all."

To this it might well be said that *Head*, being at the depot, could not possibly know all the trains the Tyler car ran in; and again, that he is careful to say, when first asked, that those were all the trains he knew about; though he afterwards goes a little farther, and says it only ran on the mail and way trains as long as he had charge of it.

But this is of slight importance, for there are no less than *ten* other witnesses who confirm *Wolcott*, and more than half of them are the plaintiffs' own.

Jeffries says excursion trains ran on the C. & A. about '45 and '46, or '46 and '47, and the Tyler car ran in them most of the time. p. 409, 410.

Ward says it was an extra car for a while to run on special occasions. Int. 19, p. 427.

Condit says it ran on the Philadelphia trains between '43 and '51, but not regularly as the other cars. p. 439.

Van Syckel says it ran in his train daily from Trenton to New York; sometimes from Camben to Amboy. This was between '41 and '46. p. 506, 507.

J. Herbert says it generally ran to Trenton after Tyler made his trip; sometimes on excursion trains, sometimes on others. These excursion trains were running in 1845. p. 564, 5.

Quigley says these excursion trains ran in '44 and '45, on the Camden and Amboy, and that the Tyler car often ran in his trains between '43 and '51. p. 480, 484.

These are all plaintiffs' witnesses. Then for appellant *Cox* says that he saw the Tyler car at Amboy from '45 to '50, though not very often. X. 32; p. 189,

Yundt says the excursion trains ran in '45 and '46 from Philadelphia to S. Amboy, and the Tyler car sometimes ran in them. X. 72; p. 204.

Crim was *Yundt's* brakeman in '45 and '46, and speaks of these same excursion trains. p. 206.

A. Heath was conductor in these excursion trains; they ran in '43 and '45, and the Tyler car ran in them. p. 270.

This second attempt to get over the testimony of Walcott has thus turned out even worse than the first; not for want of sufficient ingenuity and boldness on the part of complainant, but because that testimony was true.

14. GEORGE STOCKHAM, p. 227; entered employ of the C. & A. in 1843. Went into the paint shop of an errand in winter of '44, or spring of '45, when *Charley Vandergriff* called my attention to the double brake. I got in under the car where he was at work, and saw the cross lever; and lever on each truck, and four connecting rods. It was like the brake in Exhibit A. The way I fix the date, there was a gentleman wanted me to come out to Downingtown, Penn., and work for him that spring, 1845. That is all I know about it. This was right away after I saw this brake. I was on my way to New York, and I met him in the cars, and I havn't been to New York since, to the best of my knowledge, till last Friday.

15. THOMAS W. DUNN, p. 230. Foreman of the car trimming department of the C. & A.; since October, '44. Re-trimmed the Tyler car in the winter of '44–'5. It had six wheel trucks, with a brake on both trucks, that could be applied from either end of the car. My attention was called to it by seeing a man by the name of *Charley Vandergriff*, who was working at the repairs, and who got upon the platform and applied the brakes to see if they worked right. He first tried them on one end, then passed through to the other end and applied them there also. It applied the power to both trucks at the same time. I went in and out of the car several times that day. Had never seen any one get upon the platform and try the brakes before. I examined the construction of the brakes.

16. JOHN CONOVER, p. 233. Began to work for the C. & A. in 1839. I recollect the President getting on the train at Camden. I know it was in 1843. The car he went in was a car lately done up, and had these double acting brakes.

That I know positively, because I was under the car, looked at them, and examined them, and got a man to work them for me while I was under the car to see how they worked. I have frequently worked them myself when we were drilling the cars. I set switches and got on the car and used the brake myself, and saw that it worked on both trucks at either end of the car at once. The plan is the same as on Exhibit A. The car was named the Tyler car after the President went in it, and continued to have this brake on it.

Better testimony than this it would be hard to find. Here is a witness presumably honest, certainly intelligent, who knows just what he is saying, and with the best means of knowing whether it is true. One such witness is worth ten who simply swear that they never saw such a brake till 1851.

17. **JOSEPH HEAD**, p. 234. Went on to the C. & A. road March 21, 1845, as superintendent of the Bristol depot; stayed there till '47, then went to Tacony. I knew of a double brake on the Tyler car. I found it there (at Bristol) when I went there; it was a brake with a lever and four rods, which would pick up both trucks at once; it was like Exhibit A. What called my attention to it was, it was the only car that had that brake on at the depot; the others had the old-fashioned lever brake, to take up one truck at a time—one at each end. The next brake like that I saw was under a flat car for carrying baggage crates on the mail line; that was in the latter end of 1845; it was there that winter, before I left to go to Camden.

Here is another witness whose testimony it seems impossible to doubt. The time of his going to Bristol is fixed beyond question by the letter containing his appointment, which he still had in his possession.

18. **JOSEPH REED**, p. 236. Was brakeman on the C. & A. from May 1, 1850, to near the end of 1851. There were double acting brakes on the road in 1850. They had a lever in the middle of the car. It was on the Tyler car, and on the crate car, and on Nos. 9 and 10, passenger cars, that run in the train that I was brakeman. They had four rods, and they broke on each end of the car; the brake on either end would work on both trucks; it was the same as Exhibit A.

This only goes back to 1850, but is directly opposed to the theory of appellee, which is that there were no double brakes on the C. & A. till '51; and then they were not the *Tanner*, but the *Hodge*. This witness was brakeman only for those two years, '50 and '51, and cannot well be mistaken as to the time.

19. **JOSEPH HAGAR**, p. 238. Was brakeman on the C. & A. from peach time in '48, till peaches were done in September of that year. He used to drill out the cars in the morning; and one morning he was looking at the brake on the Tyler car, and saw it was a double brake. He told his engineer, *Joseph Trout*, he would like to have it on his car because it was double. *Trout* said he wished they could, it worked so much better. They got under the car and looked to see how it was rigged; it had a lever in the center and four rods attached, and you could get on either end and put on all four brakes at once. It was like Exhibit A. Saw the car often after that at Trenton, Bordentown and Amboy.

There can be no mistake here as to the time. The witness was married March 23, 1848, and in that way fixes the date when he began. He was on that train only that one season, and then went on a dirt train, thus fixing the date when he left.

20. Wm. Coulter, p. 240. Has been conductor on the C. & A. since Oct. 8, 1845. In the fall of '45, or spring of '46, he was applying the brake on the Tyler car and found it did not hold. I let go, and some one was applying it on the other end, and I knew nothing about it. When he let go, the handle I had hold of flew back and hit me on the hand. I found out afterwards that it was being applied on the other end. There is not the least doubt in my mind that this took place before 1847.

Being recalled, he says he now knows this occurred in the fall of 1846, while he was running the Philadelphia train in the absence of Gamble, the regular conductor, who was engaged in Philadelphia as witness in a lawsuit, and he produces a letter dated Nov. 17, 1846, which he received while running that train. He also says that this flying back of the crank took place on the morning train at Campbell's Station. We were about making a stop there, and I was on the rear platform of the Tyler car; I thought he was going to run by, and I attempted to put the brake on; so I took hold of the crank and took the slack or chain up as far as it would go, and I didn't think it was holding any, so I let go of it and, after the cars had stopped, I was standing on the platform, and when the crank revolved it hit me on the back of the hand, and it hurt me so that I felt it for a week or ten days. p. 340.

The first I ever ran on a Philadelphia train was during that week I was hit with that crank, and that week I received that letter, and after that I went back to my regular train. p. 342. Has experimented within the last two weeks, he supposes ten times, to see if any brakes on their road would operate in the same manner, and found none of them would except those on the same principle as the center lever brake. p. 342.

As it seems to us there is no way to get over this. It will not do to charge the witness with swearing falsely, for every word goes to prove his honesty. Neither can there be any mistake as to the time, for there is here documentary evidence to show the very week when he was running the Philadelphia train. And finally, there is no brake with which the facts stated could occur except this very brake that our witnesses all swear was on the Tyler car, viz., the *Tanner* brake.

The plaintiff made a desperate effort to overthrow this testimony, not to prove it false, but to show that the same thing might happen with the *single* brake. This is his argument in the court below.

"Coulter said that at the time referred to, he attempted to apply the brake at one end of the "Tyler" car, and found he could not move it, but in a moment the windlass handle flew round, and hit his hand violently, and he soon after learned that a brakeman had just been applying the brake at the other end of the car. From this defendants strove pertinaciously to show that there *must have been* a connection between the brakes at the two ends of the car, and they called numerous witnesses to state that such a circumstance *could only occur with the Tanner form of double brake.* Seeing so much effort by defendant's, complainant examined a few witnesses—Waterman and others—who proved conclusively that the same thing frequently happens with the *single brake*—though I shall not dwell upon what they say, for the matter is too insignificant—and then called Coulter himself who disposed of the subject most completely, as follows: "that is, by saying that it would be impossible for him to tell from this flying round of the crank, whether it was a double or single brake.""

It would be hard to crowd more errors into the same compass. In the first place *Coulter* does not say that he "could not *move*" the brake; on the contrary he says he did move it, that he wound it up, and found it did not hold, and so he let go; and afterwards the crank flew round, and hit his hand. If it had been true that *Coulter* could not "*move*" the brake, we should have to conclude that it was already wound up, as appellee's theory requires. But he did move it; he took up all the slack, but found it was not holding any; that is, he encountered no resistance; why? because it was already wound tight up at the other end, and the pressure at his end was all taken off This is precisely what would happen with the *Tanner* brake, and what could not happen with the single brake.

Appellee has taken great pains to prove that the single brake will fly back when loosed; there was no need of that, for everybody knew it before; but that has nothing to do with this question.

Waterman says nothing about winding up a single brake, and getting no pressure on it, and then having it fly back. Appellee took good care not to ask him that.

In the second place, and what is yet more material, appellee overlooks the fact that this flying round of the crank *set the witnesses to inquiring into the cause of it*.

Coulter did this and found that there was a man at the other end. He also experimented, and found that no other brake would act in the same way besides the *Tanner*.

J. C. Hillman, who got hit in the same way, went further; he not only found out that there was a boy at the other end, but they got under the car and found that there was a double brake. p. 249.

Even appellee will not pretend that this ever happened with the single brake; or that any one ever looked at a single brake, and found it double.

Again, J. H. Hillman, another witness who had noticed this flying round of the crank, says that when he took hold of the crank he *felt another person drawing the brake at the other end of the car*, p. 243, a thing peculiar to the double brake alone, and which appellee has made no attempt to prove ever would happen with the single brake. And *Jeffries*, one of appellee's own witnesses, says that he found out that there was a double brake on his car in the same way. p 410, 411.

Finally, plaintiff proclaims that *Coulter* has settled the whole thing by admitting that he could not tell from what happened to him whether it was a double or single brake.

But appellant did not offer *Coulter* as an expert or philosopher, but simply to tell the facts. Any one can prove a fact, though it may take a philosopher to explain it. We all know that water can be raised in a pump, but not every one can give the reason, or make the proper deduction from it. Apples fell, and the law of gravitation existed long before Newton, but he was the first to deduce the one from the other.

21. **John H. Hillman**, p. 242, says President Tyler passed through Trenton June 10, 1843; and fixes this date by producing a newspaper published at that time. In May, 1848, I was asked to help put on the brakes by the conductor. I took hold of the crank of the brake and felt another person drawing the brake at the other end of the car; or, in other words, the brakes were put on from the other end, and I noticed when the train started and the brakes came off, that the crank I had hold of flew round of itself. p. 243.

Now all this would happen with the *Tanner* brake, and it could not happen with any other. He could not have felt another man applying the brake at the other end with the single brake.

22. **James Seeds**, p. 244, was brakeman on the C. & A. 4 or 5 years ending in '46 or '7. The first he recollects of a double brake was on the Tyler car, when it first came on Quinton's line, or the way line from Philadelphia to Trenton, about 1844. About '45 or '46, it was put on a crate car; there being only one brakeman on the line it was put there to have more effect upon the wheels than a single brake could have; on that connected brake I could check 8 pair of wheels; I mean 4 pair, two front and two back. I have seen the wheels in both trucks slide when this brake was applied. I was brakeman in this train. I recollect positively that the Tyler car had a double brake in 1844, from using it daily whenever it was on our line. Mr. Lockwood asked me if I recollected the Tyler car, and I told him I did; if I recollected what kind of a brake, and I told him a double connected brake.

23. **Joseph Capner**, p. 247; was brakeman on the C. &. A. six months, beginning Aug. 3, 1847. He always looked after his own brake. In 1847 he knew the Tyler car very well, and there was a connected or double brake, with a cross lever under the car, with four rods and a crank on both ends; and when the brake was applied from one end, it applied to both trucks. It was like Exhibit A. About a year and a half after, it may be longer, I knew of a brake on the C. & A. with two cross levers. I never knew what they called it.

24. **J. C. Hillman**, p. 249; knows of double brakes on the C. & A. in 1845. He was 14 Aug. 10, 1845, and had his choice either to go to school or go to work at the end of his August vacation, and chose to go to work. It was before this he saw the Tyler car; he and several other boys made a practice of being round the railroad when out of school. He heard the new engine (the "Ben. Franklin,") and the Tyler car, were at the old depot in Trenton, and at the lower tank; we got round the car, went inside, and looked at it, came out and commenced fooling with the brakes, and while twisting them on and off at each end, I was hit in the side by the brake handle; my inquiry then was, who done it, and what done it, and the boy on the other end told me he pulled the brake out of my hand. I couldn't see how that could be, because it was different from any brake I ever saw on a car. We then got down and looked at it underneath, and we found that by putting the brake on at either end we put the brakes on all the wheels.

If this evidence is not true, there is no use in ever trying to prove anything. If there is anything a boy remembers, it is when he stops going to school and begins to work. Again, the witness speaks of the new engine, "Ben. Franklin," as being there with the Tyler car. He mentions it incidentally, and without any thought of its bearing upon the case. But it turns out that the "Ben. Franklin" was a new engine in '44 or '45, as shown by *Hutton*, one of plaintiff's witnesses, when re-called by defendants, p. 334. This fixes the time, even supposing there had been any doubt about it, beyond all question.

Then as to the brake, the witness had his attention called to it just as *Coulter* and *J. H. Hillman* had, by receiving a blow from the crank. This set him to investigating the character of the brake, when he found, on getting under the car that it was a double brake. Only two answers can be made to this—either that the witness invented the whole story, or that it did not happen till 1851, when he was 20 instead of 14.

25. ASHER PANCOAST, p. 250; was extra brakeman on the train that took President Tyler to Camden. The afternoon before they started, he and *John Banney* were standing by the side of the car which conveyed the President. *Benj. H. Harber* and *Charles Vandergriff* were at work on the under gearing; *Banney* said to me that I must ride behind the President; *Harber* said there was no use of more than one riding behind on that brake, for one man was as good as two; we got into a little kind of contradiction there; he told us to get upon the car and try it, which we did; we found it was as he said; one was on each end of the car, and we both put the brake on and found *Harber* was right. In the meantime *Captain Shipman*, the Superintendent, came along; he says, "There, you are talking again, as usual; more talk than work. I wish you would work more and talk less." The brake was connected with a rod from the center of the truck with a bolt and key to a cross bar. This cross bar applied the power to both trucks. Exhibit A represents the brake as near as I can recollect; but I cannot recollect exactly. I know of my own knowledge there was a double brake on that car. I was passenger in 1845 on an excursion train; something got wrong under the train; we stopped, and the brake rod was down dragging on the ground. The engineer came to see what was the matter, and went to the engine and got his tools and bolt and put the rod up. This rod was attached to the cross lever. *Charles Yundt* was engineer; *John Holland* fireman; *Andrew Heath* conductor; *William Crim* and *Joseph Harber* brakemen.

In 1844 there was a baggage car made for the 5 o'clock mail line from Philadelphia to New York. They put eight wheels under that, and that had a cross-lever brake on. I was not brakeman after January, 1845.

This has all the ear-marks of truth. No man could have invented all these details. If his story is not true, this witness must bear away the palm for ingenious falsehood.

26. H. H. DISBROW, p. 256; went to work for the C. & A. in 1845, on the road; in '47 went into the shop, repairing cars and brakes. In '48 had to repair a brake that worked from the center of the car, on both trucks at once; one of the rods connecting with the cross lever was broken, and he had to take it down, and take it to the blacksmith's shop, have it mended and take it back again. His wife was confined at the time, and his oldest son came after him, and he went for the doctor. She had a boy, born March 15, 1848. This is the only means I have of fixing the date, and the trouble I had in fixing the brake; being a new hand in the shop. I only recollect this one car where one of the rods connecting with the cross lever was broken.

27. CHARLES COX, p. 261; took an engine on the C. & A. in February,

'48, the one that *Colt. Whitman* ran; he had taken the one *Joseph Cox* had run; *Cox* having been killed. I lost a child that year, which fixes it in my mind. I ran to meet every mail train, and I would wait there on the turn-out, till the train arrived. While standing there I saw the brake applied, and the wheels on both trucks slipping. I saw that scores of times during the years I was running there. It was on a flat crate car. I left there in the spring of '49. The brakes were applied by one brakeman only, both trucks sliding; there was only one brakeman to a train at that time. I will swear positively I saw the wheels slip on both trucks. I saw them slip every time the train passed. What drew my attention was the fire flying from under the truck.

The time here is fixed in several ways. The death of the witness' child ought be sufficient, but there is stronger evidence. It has already been shown that *Joseph Cox* was killed Feb. 25, 1848; and it was his death that gave witness his situation on this train. He left that train in 1849, after having run it a little over a year. The proof is equally clear as to the brake. There was but one brakeman to a train all that year; witness saw him apply the brakes, and the wheels slip in both trucks. He saw this not once only, but scores of times. He was standing there waiting for this train, and with nothing else to do.

The plaintiff's answer to this is, if possible, even a greater failure than his answer to *Coulter*. Like that, too, it is an answer made in showing defendant's "contradictions and absurdities."

"As your Honor knows, one of the most useful features about a *double acting* brake is that it *prevents* the wheels from slipping! But aside from this inherent contradiction, the witness proves the falsity of his story by saying that he knew the wheels slipped *because he saw the fire fly;* and then, when asked on cross-examination *what time of day* it was, he says it was *in the middle of the forenoon*—quite too light, if the court please, to see fire fly from car wheels."

We have here two most remarkable assertions; that double brakes *prevent* wheels from slipping; and that fire cannot be seen to fly from wheels in the day time. The first is flatly opposed to the record, the second is flatly opposed to our common experience.

The evidence as to wheels slipping with this double brake is very full. *Seeds* says that he has seen the wheels in both trucks slide under this connected brake, both when applied by himself and when by others. Int. 6, p. 244.

Bogy says that he saw the brakeman put on the brake on this Tyler car, and he saw the wheels slide in both trucks. Ints. 3, 4, p. 266, 7.

These however are appellants' witnesses. But the same fact is proved yet more fully by appellee's.

Ragland says that as the *Stevens* brake is ordinarily arranged the wheels do sometimes slip. p. 858.

Jackman says the wheels often slip with the double brake. p. 890.

Renwick, appellee's expert, says that in all brakes he has ever seen the brakeman can slide the wheels. p. 940. And he shows very clearly why this is so with the *Tanner*, viz., because with the increased leverage a greater pressure can be brought to bear. p. 940, 942.

Watts says that he has known the wheels slide with the *Tanner*, and with the *Hodge*. *I have seen them slide repeatedly coming into stations. It is a very common thing to see them slide.* p. 796–7.

Stull says he has seen one pair of wheels slide, or two pair, or all, with the *Tanner*, the *Stevens* and the *Hodge*. p. 804–5.

Weightman gives the result of certain experiments with the *Tanner* brake on the Long Island road, where the wheels seem to have done nothing else but slide. p. 808–9.

Doane was present and tells the same story. p. 813–14. He also says that he has seen wheels sliding with the *Hodge* brake when coming into a station, sometimes a part of the wheels only, sometimes all. p. 821; and finally *Kraft* says he slid all the wheels with the *Tanner* brake, and he has noticed the same thing with the *Hodge*, when coming into a station. p. 819.

As to seeing fire fly in the day time, any one who has ever been in a blacksmith shop, or struck sparks from steel, or watched the revolutions of an emery wheel, knows that there is no difficulty about that. The sparks thrown off from wheels are of the most intense heat and brightness; as *Renwick* says, "the particles are so intensely hot as to burn in the atmosphere, or in other words they are heated to a high white heat." p. 941.

28. **Wm. Disbrow**, p. 264; went on to the C. & A. June 11, 1847, as fireman. In the fall or fore part of the winter began firing on the Amboy line. In the winter of 1847, at the end of our route, near Camden, one of the cars was thrown from the track; it was a flat baggage car. I was sent under this car to disconnect the brake; it had a cross lever in the center of the car, with four rods from it. I disconnected all the rods from the cross lever. Exhibit A represents the brake. This happened the first day I fired on that line. I fired on that line, I think, only to the end of '47. I am not positive.

Here we have both the date and the brake clearly proved. It was the very first day he ran on the Amboy line; it was a flat baggage car that was thrown off; after that event he went on a dirt train, where there were no baggage cars.

29. **Patrick Bogy**, p. 266; went on the C. & A. July 4, 1843, as brakeman on a freight train, with passenger car attached; was brakeman about five years; then conductor on freight train. While brakeman I saw the brake on the Tyler car, and on a flat baggage car. I have been in Camden, and saw the mail train go in and out there every day; and saw the brakeman put on the brake on the Tyler car, and the wheels slide in both trucks. By hearing others talk of the brake I made it my business to go and look under the car, and see how the brake was connected, and found it connected by a lever under the center of the car. When the man took hold the crank at one end it applied the brake to both trucks, and made the wheels slide under both trucks. I observed this brake along in '44 and '5. Saw it first in '44; had heard men talking about it, and it made me more anxious to see the

car, particularly to see how the brake was rigged. A few days after I was taken sick, intermittent bilious fever, and had a doctor's bill to pay; his bill was dated October, 1844. I heard the engineer say that when the brakeman applied the brake on the Tyler car, he felt the engine jerk. I heard them remark that it was such a good brake that, if we had more of them, they would not have so much trouble.

30. R. C. BUZBY, p. 270, is time keeper on the C. & A. road. Knows of the Tyler car before it left the shop, to take the President over the road; it had a brake which worked from each platform; it had just come from the Philadelphia & Trenton road, and was fitted up in our shop. It was different from anything we had before, made me notice it; different springs, spiral and elliptic. I took notice of the brake, and looked underneath to see why, by turning one crank at one end, it would put the brakes on both trucks. I found it was by a cross lever, fastened under the bottom of the car.

Now we ask in what can this witness be mistaken? Certainly not in the time; it was before President Tyler had been over the road, before the Tyler car had begun to run, that he saw this double brake. He examined the brake particularly, to see how it was that all the brakes were applied at once.

31. ALFRED HURD, p. 347; went on the N. J. R. & T. Co., as engineer, about 1840, and left about 1850. I know of a brake on a car of that road termed a double brake. I couldn't say exactly when I first saw it; it was in the administration of *Joseph F. Talson.* It acted on both trucks, instead of one, from either end of the car. I am sure I saw the brake during *Talson's* administration. What took my attention was no more than I saw one man could apply the brakes to both trucks, and it would answer the place of two men. It was a passenger car; what train it run on, or where it run, I could not tell.

Talson left the New Jersey road in August, 1849, p. 303.

32. ISAAC DRIPPS, p. 366. was superintendent of machinery for the Cam. & Am. road from 1831 to 1852 or '3; is now master machinist on the Pitts. Ft. W. & Chi. Road. The first I saw of double brakes, that is, brakes that would apply to both trucks, was on a car that was rebuilt by the company's shop at Bordentown, called the John Tyler car; the year I can't tell you. I can only fix the date in this way—when Pres. Tyler first crossed the road, after being inaugurated, he rode in that car, and the car was called the "Tyler Car" afterwards. There was a double acting brake on the car at the time it took him over the road; the brake was applied by a brake-shaft at the end of the car; of course, as they wound up the shaft, it applied the brake blocks against the wheels of the trucks, the four outside wheels of each truck, the trucks being six wheeled. I cannot state any particular time that I examined the brakes; but as the car was in the shop being rebuilt, I of course saw all the work put on it as the work progressed. I cannot specify any particular time; I suppose I saw it in the shop every working day. I distinctly remember when the car was finished; the general plan of the brake; that the brake blocks were applied to the wheels of both trucks, but I cannot recollect the arrangement of the details of levers, rods and blocks. I distinctly remember that I saw the brakes at the time the car was finished.

The car, when first rebuilt, was a very prominent car to us railroad people; we had put on it all the improvements that we had made up to that time.

This is our evidence, and, if it is not true, we think the court will agree with us that this is one of the most extraordinary cases of wholesale perjury ever known. We have here over thirty witnesses, not one of whom had any interest in the suit, and most of whose testimony is of such a character that it is impossible to account for it on any other theory than wilful perjury, or, as we think, even on that. We would here ask the attention of the court to the following suggestions:

First. How happened it that all these witnesses agreed to place this double brake upon these two cars, the Tyler car and the crate car? This is the central fact in their whole testimony; and one that certainly requires explanation. And until it is explained we submit that this alone is sufficient to make out our case. Such a coincidence, though simple enough if the testimony is true, is little less than a miracle if that testimony is false.

Second. These witnesses, though nearly all starting out with this central fact, do not stop there, but add to it the greatest variety of incidents, showing how and when and where their attention was first called to this double brake; incidents that they could never have invented for themselves, and which it is scarcely possible any one else should have invented for them. *Charles Cox*, *B. L. Wolcott* and *J. C. Hillman* afford a marked illustration of this, though there are many others nearly as striking, and hardly one but what has more or less of the same thing.

Third. In the midst of all this diversity these witnesses yet preserve the most remarkable unity and harmony, as to all those matters upon which any two or more of them happen to testify. Many of these matters tend directly to prove the main fact at issue, while others derive their sole importance from the casual and therefore all the more valuable confirmation they lend to the witnesses.

Fourth. This evidence is positive, and not negative. It is direct, and not argumentative. The witnesses swear to what they saw, not to what they did not see; to what they themselves knew, not to what was told them by others. Most of them actually saw the brake; they handled and worked it; they examined carefully into its construction and operation—they all had some special and sufficient reason for knowing that it was a double brake.

Fifth. As to the time, the question here is neither nice nor difficult. It is not a question of a month or a week, but of years. According to appellee, there was no double brake on the Camden and Amboy road before 1851 or '2, and then it was the *Hodge*. The *Tanner* was not introduced till 1854. But we say it was on the Tyler car as early as 1843; and many of our witnesses carry it back to that date. Others did not see it so soon, either because they were not on the road, or did not have their attention called to it. But all put it much earlier than 1854. To suppose that any of them could have made so great a mistake as to put '43 for '54, or even for '51, is out of the question.

The evidence is assailed in various ways. First, it is alleged, as to some of our witnesses, who have fixed the date by marriages, births or deaths, that "there is no connection between such events and the use of a double brake; and that the effort so to fix the date is almost invariably a sign of a *corrupt* or utterly ignorant witness."

But this sort of memory is recognized by every standard writer on the subject as of all the most universal. It is the memory of the unlearned, of men who have not been trained in the severer methods of the schools; of the Indian, the trapper, the backwoodsman; of many women, and of children; in short, of all ages and classes of the uneducated everywhere. It is the memory dependent on propinquity of time and place. Or, as Dugald Stuart expresses it, "The bulk of mankind associate their ideas chiefly according to their most obvious relations, those, for example, of resemblance and analogy, *and above all, according to the casual relations arising from contiguity in time and place.*"

This memory, though unscientific and in one sense illogical, is nevertheless the strongest and most reliable, especially for retaining what might seem to others wholly isolated facts. It is almost the only way indeed in which such facts can be remembered. For as they are not parts of any harmonious whole, and are of no use either to reason or philosophy, they must generally be remembered in this way, or not at all. Of course we do not pretend that this memory, more than any other, is absolutely incapable of error. Those who depend upon it are liable to err the same as others, but the fact that they do rely upon it throws no imputation on their honesty or intelligence, whatever it may prove as to their mental habits and training.

Appellee next advances a theory, by which he seeks to account for so many witnesses swearing as they have done, without impeaching their honesty. He says that the record is full of proof that in 1843 and long after, it was common to fit the passenger cars of the C. & A. and N. J. roads with two single brakes, one at each end; that these were called double brakes, and the witnesses have confounded them with double connected brakes." And he adds that some of the witnesses "speak of knowing that double brakes were in use on the C. & A. road *by their seeing the brakes applied to all the wheels.* See, for example, testimony of Charles Cox."

But this theory is not supported by the fact. Very few, I think only two, of the witnesses speak of two single brakes as a double brake. And as to Cox, instead of saying what is above imputed to him, he says he knew they were double brakes because they were applied to all the wheels *by one brakeman*, which is an entirely different thing.

But this is unimportant. For this theory, even if true, wholly fails to meet the case. In the first place, if double brakes were so common in 1843, how happens it that the witnesses speak only of the Tyler car and the crate car? In the second place, they do not speak simply of *double* brakes, but they say *double connected* brakes—they saw the cross lever, and the four rods—they had to disconnect them to get out the trucks—they got under the car, and examined them

—they got another man to work them—they found that a man at one end broke on both trucks; they ran over the tops of the cars to get to the Tyler car in a dangerous emergency, because it had this double brake—in short, there is scarcely a word in this whole testimony that does not give this theory the lie.

Finally, as the appellee will have it, this whole scheme was got up by Talson & Lockwood, and by them forced upon the other witnesses. Talson, a man of the highest respectability, is never spoken of but as "this fellow Talson;" while Lockwood, without the slightest foundation, is pronounced a "shrewd rascal," and charged with having deliberately "made up his mind to adopt some prominent incident, like the President's journey, as the starting point for his fiction." Whether he also invented the stories told by Charles Cox and B. L. Wolcott, J. C. Hillman, Coulter, Jobes, Gamble and Head, and all the rest of them, we are not informed.

Having thus presented our side of the question, let us see what is brought against it.

The appellee has here three sets of witnesses—first, those who were on the Camden & Amboy road, or saw its cars, and say there were no double brakes till 1851. We give such portions of their testimony as we deem material, leaving it to him to supply deficiencies, if any.

1. J. E. HUTTON, p. 387, says that the Tyler car, when it first came out, had a single brake, and until 1851; and the double brake as long as he knew it afterwards; that he noticed it particularly after it got a double brake.

This sounds well, but will not stand examination. *Hutton* was not on the Camden & Amboy road; he was an engineer for the New Jersey road, and *thinks* he had the Tyler car in his train prior to 1850. He does not tell us how he knew it had single brakes; that he ever examined the brakes or operated them, or saw them, or had anything to do with them in any way.

2. EDGAR MORRIS, p. 390, says he saw the Tyler car about twice a week from '43 to '49; that, *to the best of his knowledge*, it had a single brake; that it could not have had a double brake for any length of time without his seeing or hearing of it: that he was led to observe the kind of brake on the Tyler car by the inspection of cars, looking under them frequently.

But after all this, he says he cannot tell, *of his own knowledge*, what kind of brakes were on the Tyler car from '43 to '49; that he had no practical knowledge of double brakes; he never inspected any cars, he was not in the employ of the C. & A., but in the repair shop of the N. J. road; he doesn't know whether he or the men in his shop ever did any repairs on the Philadelphia cars, but *thinks* they did.

3. GEORGE BROWN, p. 396, went on the New Jersey road in July, 1850. Saw Camden & Amboy cars come into Jersey City; *not a great many.* They used to do the light repairs on those cars. If there was anything wrong with the trucks the C. & A. men attended to that. *Thinks* they had no double brakes before '51; *thinks* he should have known it. He used to go under these C. & A. cars—but he does not say he ever did this before 1851.

4. D. H. **Baker**, p. 403, never saw any double brakes on the C. & A. cars that came into Jersey City from Sept. '49 to Sept. '51; *thinks* they could not have had any without his knowing it. They did all slight repairs on these cars.

But Baker was not in the employ of the C. & A., he was master car-builder of the N. J. road; of course he never himself did any of these slight repairs on the C. & A. cars.

5. S. H. **Brown**, p. 407, *thinks* that one Cummings built four or five cars for the C. & A. road between '49, and '52 or '53, with single brakes; the argument being that no road would buy any more single brakes after they got the double.

But the double brake was well-known on the C. & A. road in 1851, as the plaintiff himself asserts. This argument therefore proves too much.

6. D. T. **Jeffries**, p. 409, used to go on excursion trains in 1845 and '6, or '46 and '47; twice a week during the season to assist the conductor. The Tyler car was in these trains and had a single brake.

But the question is, how did he know? How came this boy of 17, who went to assist the conductor, to examine so carefully into the construction of the brakes on this particular car? For the court will notice that it is not an easy thing to see. That is, no one could see whether the brake was single or double without stooping down and looking under the car. Nor would he be at all likely to see it then, unless he had been told beforehand that there was something peculiar about the brakes. The *Tanner* brake is the same in the trucks as the old single brake; it is nothing but two single brakes united by the centre lever, and its two short rods. Any one, therefore, who was not thoroughly acquainted with the brake, might look under the car a hundred times without seeing that the brakes were double.

This suggestion applies not only to this witness, but to nearly all the witnesses for the appellee. Unless they had a special reason for examining the brakes on the Tyler car, they would be very apt not to notice any difference between its brakes and the single brake. And as a rule they had no such reason. In other words, there was no reason why they should know whether the brakes on the Tyler car were single or double. But this boy says he used to examine the Tyler car almost every time he came where it was, about twice a week, while on these excursion trains, and once or twice a week while on the way to Tacony, up to the fall of 1849. He was led to do so from its being a much easier riding car than any other; all the men, when they met together, would talk about it, and we would get together and look at the gear, the springs and construction of the car, that we might observe what new improvements were being made.

Yet after all these examinations, he is unable to describe any of the peculiarities of the car; and afterwards, when he does attempt it, says that *it had four wheeled trucks, when the most noticeable thing about it was that it had six wheels*, and that it had spiral springs, when it had both spiral and elliptic. And finally, he says, int. 21, that in 1851 or '2 he went to apply the brake, and found most of the pressure taken off by a man at the other end, and on looking found that it was the *Hodge* brake, whereas the pressure is thus taken off only by the *Tanner* brake, and is rather increased by the *Hodge*, as the court can readily see by the models.

7. ERASTUS REID, p. 416, was on the New Jersey road from '36 to '49, in the repair shop. About 10 Cam. & Am. cars came to Jersey City daily; they had single trucks. He never repaired or inspected them himself, because that was other men's business.

8. AMBROSE WARD, p. 425, was in the repair shop of the New Jersey road from 1842 to 1850, and used to repair cars of the Cam. & Am. road; only light repairs. They had single brakes until about 1850. His duties did not specially require him to know what kind of brakes they had. Remembers a car that had a water closet on the platform; noticed it particularly because it was so novel. I saw it a great many times. I must have seen it most every time it came there, because I was one of the chief men about the depot.

And yet this "chief man about the depot" says: "I cannot state what kind of brake that car had prior to about 1850. I have no recollection about what brake was on that particular car." And again, "I do not recollect distinctly what brakes were in use on the baggage, crate and passenger cars of the Camden & Amboy road prior to 1850."

It is needless to say a word about this. It proves nothing, except that a man might be the chief man about the Jersey City depot for many years, and might make the necessary slight repairs for the C. & A. cars, without knowing what kind of brakes those cars had on.

9. JAMES FERNALD, p. 429, conductor on the N. J. road from '37 to '63, says that the C. & A. cars, sent over that road prior to '49, had a single brake on each truck. But he says he does not know this from personal inspection, nor has he told us how he does know.

10. THOMAS O'MAHONY, p. 432, was another man in the Jersey City shop, from '46 to '61. *As far as he knows* the C. & A. cars, that came there between '46 and '49, had single brakes. He did not work on or look at the trucks, and can't say anything about what brakes they had on before '49. Is certain they would have adopted double brakes before '51, if the C. & A. cars had had them.

We will dispose of this argument of his hereafter.

11. A. C. CONDIT, p. 436, was on the N. J. road from 1841 to 1851. He is positive that there were single brakes on the Tyler car, and on the other C. & A. cars that came to Jersey City before 1851.

But it is difficult to believe him when he says that he inspected the brakes on the C. & A. cars—cars not belonging to his road—all through, often; twice a month, or oftener, all the time from '43 to '51.

He says too that he noticed the brakes very particularly *when they put on the double brake in* 1851, thus clearly implying that he had not noticed them particularly before. And why should he have noticed them before, unless he had heard that they were double? He had no motive for it.

12. E. T. MOORE, p. 443, was engineer on the N. J. road from 1846 to

1851; had C. & A. cars in his train every day. They had single brakes. Knew the Tyler car about three years, and saw it a great many times. *I know of my own knowledge that it had a single brake during those three years. It never had anything else on while I knew it.* I noticed the car particularly, as it was different from the other cars. I saw the brakes on the car quite often. While I was on the N. J. road from '46 to '51 there could not have been any double acting brakes on any of the C. & A. cars, that were in my trains, for any length of time, and I not have known it.

We ask particular attention to the above. This witness is as positive as a witness could be, and yet he afterwards took this all back. He says that no one was present on his former examination but *Sayles*, the complainant.

"I told him I knew the car, and had seen it frequently; in regard to the brake I told him I could not say whether it had a double acting brane or a single acting brake; it had a crank on the end. I told him I didn't know much about it; that I didn't think I would be of much use to him; that it might have had a double acting brake on, and it might not. I could not tell anything about it. I told him the first double acting brake I saw, to notice it, was on the New Jersey Central, in '52 or '53," p. 335. "Mr. Sayles asked me and I told him it might have had a double acting brake, and it might not; and I say so still. I had nothing to do with the cars. I would not swear what kind of a brake it had on." p. 336. The Cam. & Am. cars in my train might have had double brakes on; I would not have been likely to have known it. *I had nothing to do with the brakes. I did not at that time know the difference between a single acting and a double acting brake.*" p. 337.

If we could get at the truth, we should doubtless find it to be much the same with nearly all the appellee's witnesses. They knew that double brakes were introduced generally about 1851, and they are ready enough to believe that they could not have been in use before; and they swear accordingly, not from any positive knowledge, but partly from this impression, and partly because others have sworn to the same thing.

13. James McFarland, p. 469, is another characteristic witness. He is sufficiently positive that there were no double brakes on the C. & A. cars that came to Jersey City; but he had nothing whatever to do with those cars; he used to see them pass, and he used to examine them to see if they had any improvement. But there is no proof that he ever examined the Tyler car, or even that he ever saw it. And as the plaintiff never asked him a word about that car, it is fair to assume that he never did see it or had no recollection of it. If he did not remember that, his memory clearly is good for nothing.

14. Wm. Quigley, p. 477, is appellee's best witness. If he were uncontradicted by so many others his testimony would at once be received as true. But when we remember that there are at least twenty witnesses for appellant, every one of whom is at least as good as he, we are constrained to believe that his ardor has here carried him beyond the bounds of truth.

Quigley was only a boy in 1843. He was not at that time in the employ of the road, but was only hired now and then as an extra hand by the brakeman.

His mechanical ideas may have been great, as he says; and if there had been any reason for his examining the brakes on the Tyler car, his youth would be no great objection, but there was no such reason. He knew that the *Hodge* brake was generally introduced after 1851; he remembered that, of course, and he remembered too that this was the first time he ever heard of a double brake, and nothing would be more natural than for him to suppose that no such brake had been in use before. He doubtless *supposed* himself to be familiar with the brake on the Tyler car. But it is asking too much to ask us to believe that this boy kept up for so many years a careful inspection of brakes, that, so far as he knew, were precisely the same as all the other brakes on the road; or that he "recollected particularly about the brakes that were put on the Tyler car when it was rebuilt in 1843," or that he "distinctly recollected the brakes" from 1843 to 1851. We can understand how this might be where there was some marked improvement to fix attention and stimulate the memory, but not where the witness supposed there was no improvement.

Moreover, though *Quigley* swears he was brakeman, fireman or engineer on the C. & A. from 1843, the books show that he was not in their employ till 1847; pp. 358, 361, 363; and the truth is that previous to that time he was only employed by the men when they were sick or absent. pp. 560, 563.

15. R. VAN SYCKEL, p. 505, is quite positive that the Tyler car had single brakes from '43 to '46. But he was engineer and had nothing to do with the cars. And he says he thinks he never heard of a double brake while on the road, and that is why he is sure there was no such brake there. Cr. Ints. 22, 23.

16. J. COUNSELLOR, p, 516, is one of appellee's best witnesses, but his means of knowledge are not to be compared to those possessed by the witnesses for appellant. He was conductor not on the C. & A. but on the N. J. road. He says the Tyler car had single brakes, but does not say how he knew; does not say that he ever saw the brakes, or examined them, or operated them, or ever had the Tyler car in his train. To compare his evidence to that of men who made the brake, who put it on, who repaired it, who curiously examined it, to see how it worked, would be equally unjust and absurd.

17. I. W. VAN HOUTON, p. 525, was in the car shop of the N. J. road at Jersey City, and used to repair the Camden & Amboy cars that came there "to as small an extent as possible, with a view to safety in running." Does not remember ever seeing double brakes on any of those cars, and thinks he should if they had been running for any length of time, though it is possible they might have come there without his seeing them.

18. ISAAC NOSTRAND, p. 530, was baggage master on the C. & A. in '48, and conductor in '49. *Thinks* there were no double brakes on the Tyler car, but says I can only swear to my belief. I believe there was none. Never inspected the brakes, but formed his opinion only from working them. And he does not recollect that the Tyler car was re-built in 1849, but *thinks he would have known it if it had been.*

That is, he gives the same reason for believing that the Tyler car ~~would~~ not
could

have been re-built in 1849 that is given by most of his fellow witnesses for believing that it had no double brakes; and yet the Tyler car *was* re-built in that year, and no body denies it.

19. JOHN BRIGGS, JR., p. 533, was baggage master on the C. & A. in '49. They were then using all single brakes, I believe. If there had been any double brakes, I should have known it. Double brakes were put on about two years and a half after. He found it out by their stopping so much quicker. He never saw more than half their cars.

This evidence is of little weight. It does not appear that the witness ever saw the brakes, or ever operated them. He says himself he was not familiar with their construction. He says he knew of the Tyler car, but that is all he is asked to say about it.

20. CHARLES H. FRISBIE, p. 552, was fireman on the N. J. road between '46 and '49; used to see the Tyler car. I do not know of any brake on it except a single brake while I knew it. I *think* there could not have been any double brakes, on the C. & A. cars that ran into Jersey City, for any length of time, and I not know it. Was not then in the habit of noticing particularly any new improvements. Had nothing to do with the brakes.

21. PAT. H. FLANNEGAN, p. 556. This witness is one of the most positive of all produced by appellee. He was fireman on the N. J. road 3 years and 9 months; saw the Tyler car very often—frequently noticed the car, wheels, trucks and brakes; operated the brakes as often as twice a week; has looked under the car to see how the brakes were made. They were single brakes.

So far nothing could be more complete. But on cross examination he says: "*I mean by a single brake, a brake at each truck.* The brake wheel on the Tyler car had no ratchet. When I put the brake on I had to hold it with my hand, and when I let go of one end, it would let go what it held, until I could go to the other end. I am positive they were single brakes, because *I could screw up one end, and the other would be entirely at liberty.* I know it was at liberty for I tried it. I could not be at both ends of the car at once. When I would screw up one end, and run to the other, I would find it at liberty; there was no pawl and ratchet at either end of the car. The difference between a single brake and a double brake is, that one is a single brake, and the other is a double brake. *A single brake is on each end, or has a windlass on each end of the car;* double brakes are connected. I know there was no rods on the Tyler car to make connections. I could see it, passing by, that there were no rods. *I never thought of looking for any.*"

There are several points here to be noted. First. The witness thought the brake single because after screwing up one end, he found the other at liberty; whereas without a pawl and ratchet, this would be so with any brake. Second. He also concluded that the brake on the Tyler car was single, because there was a windlass at each end. What was the use of having two windlasses when you could apply all the brakes with one? was his reasoning. Third. He never thought of looking to see whether there were any connecting rods on the Tyler car.

All this was doubtless true of most of appellee's witnesses. They too reasoned in the same way. They too never thought of looking for the connecting rods. As we have said before, there was no reason why they should look unless they had first heard that the rods were there. Most of the appellee's testimony is easily explained in this way.

Finally, this witness swears that he did see some double brakes during the time he was on the N. J. road. They were on *a flat freight car*; that he cannot describe any double brake now in use; and does not know what brakes the Northwestern use on their cars; though then an engineer on that road.

22. **Benj. T. Seward**, p. 562, was fireman on the C. & A. in '43 and '44; then engineer till '50 or '51. Saw the Tyler car when rebuilt. Sometimes would see it every day; then not for a month or two. Could not say what brakes it had, but his opinion is they were single.

23. **J. Herbert**, p. 564, used to be brakeman on the C. & A. remembers Pres. Tyler going over the road; saw the car; it had a brake on each truck, and it took two men to brake both. He left the road about two years after.

But on cross examination he says first that he examined the brakes on the Tyler car at Bordentown the day it took the President over the road; because he had to see to the brakes when he was on the road; then that he was not on that train at all, and had nothing to do with the brakes, but was on another train. That when he came along he always cast his eye down on to the brakes and on the wheels too; whereas it was impossible to see the brakes in that way. He says that he has always had the brakes on the C. & A. and distinctly in his mind, so that he could have told at any time since what brakes were on the Tyler car; and that everything else connected with the car is just as fresh in his recollection. But on being asked to describe it, he contrives to be wrong every time. He thinks the seats were all alike—that it had *four* wheel trucks, and an *inside* privy—whereas the seats were *not* all alike—the trucks had *six* wheels, and the privy was *outside*.

The springs, which are also peculiar, he does not remember at all. And worse yet, he says there was then nothing new about the car, when everybody else says that it was just rebuilt, and was almost all new—a "silver palace car," but this witness did not seem to know that it had been rebuilt. And finally, he says, "I am near about sure that the car had a brake on each end. I am sure of that; I am sure;" thus showing that it was this fact which made him think it was not a double brake.

Nothing more can be needed to show the utter worthlessness of such testimony; but we may add that he had had a quarrel with Lockwood, and had been accused by him of theft.

24. **Geo. W. Teese**, p. 572 and 575, says he was engineer on the C. & A. about 5 or 6 years, and finally left in '51; that he knew of the Tyler car before he went on that road, and also after; that during the time he knew of her she had on the *Hodge* brake. Then that the first he knew of her having the *Hodge* brake was when he left the road in '51; before that she had a brake at each end operating on one truck; and so in '43. Being recalled he blows hot and cold, sometimes perfectly sure; "no mistake at all about it;" then he cannot "say exactly," and then "knows it, of course." But through it all he never says a word to show how he knew what kind of brakes were on the Tyler car.

No one on reading this whole testimony can help being struck with its thin and watery character as compared with appellant's. It is nearly all negative. It is what the witnesses did *not* see. The witnesses therefore may easily be mistaken. Or, as this court says in *Still v. Huidekoper*, 17 Wall. 394, "it is possible to forget a thing that did happen; it is not possible to remember what never existed." Out of all these witnesses only five or six say that they ever saw the brakes on the Tyler car, viz.: *Jeffries*, *Condit*, *Quigley*, *Flannegan*, and *Herbert*.

Hu[illegible] had the Tyler car in his train from '50 to '55, and he *thinks* in part of '49. He noticed it particularly *after it got double brakes*. And he says it had the *Hodge* brake on all that time; whereas the fact is, the *Hodge* was on only a short time, and was then superseded by the *Tanner*.

Counsellor does not say he ever saw the brake on the C. & A. cars; nor *Frisbie*, nor *Teese*.

O'Mahony says expressly that he never did, and can't say anything about it.

Nostrand can only answer to his belief, and he does not even remember that the Tyler car was rebuilt soon after he went on the road.

Morris and *Van Houten* and *Seward* say they can't tell of their own knowledge what brakes were on the Tyler car.

Ward has no recollection about it.

Reid recollects nothing about the car, except the seats.

Moore says he knows nothing.

Fernald and *Briggs* are asked by appellee if they recollect the Tyler car. They say they do, but there the matter is dropped.

George and *Silas Brown*, *Baker* and *McFarland*, are not even asked whether they remember such a car.

It is said, however, that if there had been a double brake on the Tyler car these witnesses must have heard of it. But this is by no means certain, still less that they would have remembered it. The Tyler car had 12 wheels, and this struck many of the witnesses as something very remarkable. But *Jeffries* did not remember this, nor *Herbert*. It had its saloon and privy on the outside, something still more peculiar; but *Herbert* had forgotten this also.

It was in every respect a remarkable car in 1848, when it took Pres. Tyler over the road, unlike any they had ever seen, a "silver palace car," fresh and new from the repair shop, but *Reid* can recollect absolutely nothing but the seats; while as for Herbert, though professing to remember everything, he in fact remembers nothing—not even that the car had just been rebuilt. And yet where one man would remember the brakes, twenty would remember these more showy features.

Again, if it be said that such an improvement could not fail to attract attention, we reply, first, that being used only on a few cars it would not be noticed; and second, that not one railroad man in ten can tell to day what kind of brakes is in use on his road.

I have had occasion during the last four years to talk with all sorts of railroad men, and to examine many as witnesses as to the various devices in use on their roads, and particularly as to the brakes; and have found hardly one who could tell me what they were then using, unless he had made examination for that express purpose, or had himself made the thing in question. A man may be a brakeman or conductor on the same car for years without being able to tell anything about the brakes; and it might almost be said that this was the rule rather than the exception.

The second set of witnesses for appellee consists of several of appellant's, who afterwards retracted. Great stress is laid on this, but we are not sure that our case is not helped by it quite as much as it is injured.

1. JOSEPH CAPNER, p. 571, is of little value either way. He had before testified that, when he went on the road in '47, there was a double brake on the Tyler car. He does not say now that there was not, but only that the *Hodge* brake was the first he saw, and he *thinks* that was in 1850, and that before this, the single brake was used on the C. & A. road. He says not a word to explain his former testimony, or how he came to change it.

2. H. H. DISBROW, p. 575, is of even less importance. The sum of both his depositions is simply this, that he has no recollection at all about the brakes.

3. R. C. WALCOTT, p. 588, is another of the same sort.

4. JAMES SEEDS, p. 602, had before testified quite positively that the Tyler car had a double brake in '44. He now says that he has thought the matter over, and thinks it was somewhere from '51 to '55 he first saw such a connected brake.

5. ASHER PANCOAST, p. 601, as we fully admit, was one of our best witnesses, and now turns against us. But we say confidently that his first story was the truth. It could not but be true. No man could ever have invented all those details. Afterwards he had a quarrel with the road, or was discharged, as *Lockwood* says, for drunkenness; and then falling into the hands of appellee, he was induced to change his testimony. We cannot positively say that he was bribed, that promises, more or less definite, were made to him by appellee, but we have

no doubt that such was the fact. And there is evidence enough in the case to warrant this assumption. Our own opinion is that, if all the promises of this sort made by appellee were to be righteously fulfilled, there would be little left of his decree. Though we admit that they were generally framed in such a way that it would be difficult to enforce them at law. It was not often that the appellee went so far as in the case of *Mrs. Nicholls*, where there was a plain promise to pay in case of success; saying nothing of the thousand dollar bond, which *Tanner* gave and *Sayles* assumed; but his approaches were usually much more guarded. Instead of a blunt promise he dealt rather in hints, plain enough to be understood, and yet vague enough to be denied.

This is what he said to *Lockwood:* "He said I must be mistaken, and he wanted to know *if he couldn't do something for me*, to say that I was mistaken as to date; he said if I could, that would leave a doubt as to the date of putting the brake on the car; he said it was worth hundreds of thousands of dollars to him, and he had a suit pending at Chicago for $40,000; and had it not been for the model called the John Tyler, Exhibit A, it would have been decided in his favor." p. 172.

Pancoast himself says that "*Sayles* has never promised me a cent, but I suppose every man has his price." p. 624.

Sayles told *Cudlipp* that "he had some $50,000 to spend in this case, and he was not going to be mean with it." "He said he understood I was the only man that could influence *Joseph F. Talson.*" "He wished me to see *Talson* in regard to this John Tyler car, and have a conversation with him; and see if I could not whet up my memory a little, and to ascertain what evidence there was against *Sayles* and his side of the question." p. 350.

"He represented the value of this patent right in the neighborhood of somewhere from one to three million dollars, as near as I can recollect, provided he gained the case that he had pending against railroad companies; he wished me to see *Talson*, and if I could influence him so far as to hold back what evidence he had collected for the railroad companies, and to go no further with his own evidence than to answer questions as they were put to him, that he would secure to me an income of ten per cent. of the whole income of said brake." "He afterwards agreed to go before any lawyer in New York, and secure me this ten per cent. income." Further, "when Sayles said he would agree to give me this ten per cent., which he thought would amount to the snug little sum of somewhere about $100,000, he said that I was at liberty to divide it with anyone, or do as I chose with it." p. 351.

He said to Talson, "Mr. Talson, I know you hold in your hand sufficient evidence to seriously injure my patent, or to kill it; but if you will not advance anything on this trial, and I win the suit, I will make you a very handsome present." p. 324.

Again, the contradictions in this second testimony of *Pancoast* show that he had now left the path of truth. Thus he first says that *Ryhow* told him there was a suit; that these parties had sued the Camden & Amboy Company, claiming $50 a car for every car it was used on, and then he began to count up how much it would come to—he said how much it would come to, but I don't recollect how much."

Being asked if *Ryhow* said anything about it being important for the Camden & Amboy Company to defeat the patent, he replies: "Yes, sir. *I don't recollect what he said.* I recollect he said it was a big thing for the company. p. 602.

Now in the first place it is impossible for *Ryhow* to have said anything about a suit, for there was no suit against the Camden & Amboy road, that road having been settled with years before, in 1855.

In the next place *Pancoast* says, when recalled, that *Ryhow* never said anything to him about it; and that he *Pancoast* said to *Lockwood*, "I don't see why the Company should take such interest in it. I understood *Mr. Van Rensselaer* had paid Sayles for his right." p. 625.

We insist then, that Pancoast's first story was the true one; that it has all the ear-marks of truth; that his second story has the marks of falsehood, and that in the charge of drunkenness against *Pancoast*, whether true or false, in his evident ill-will against the company, and in the wiles of appellee, we have furnished a sufficient explanation of his conduct. But he may not have been wholly dishonest. He talked with his old comrades and they changed his mind. These "old comrades" were in all probability, *Crim* and *Yundt*, who first deceived themselves and then deceived him, as we shall next show.

Crim and *Yundt*, as the court will recollect, were engineer and brakeman on the same train in 1845, in which *Pancoast* was a passenger, when the falling of one of its rods led them to examine into the construction of the brake. Being recalled by appellee *Crim* says he is not certain, but *thinks* he was mistaken not as to the time, but as to the character of the brake. After giving his first testimony, he says he "was in the Camden & Amboy yard, and thought he would just look at the cars, and see whether he was mistaken or no. He examined and found *the long rod running clear through the car—the brake* rod—and he came to the conclusion that *that rod* was not there, that is was not on at the time he was on the Camden & Amboy road." pp. 600, 601.

Now this, so far from weakening his former testimony, confirms it. The court will notice the reason he gives for thinking he must have been mistaken. He found on one of the cars in the Camden & Amboy yard a brake that had a long rod running clear through the car. There was no such rod on the brake that fell down in 1845, therefore he concluded that it could not have been the same brake. But a word will make this plain. The only brakes having this long rod running clear through the car are the *Stevens* and the *Hodge*. The *Tanner* has nothing of the sort. The witness happened to look at a car having the *Stevens* or *Hodge* brake; he knew that that was not the brake he saw in '45, and came at once to the conclusion that it could not therefore have been a double brake. His present testimony, therefore, only goes to show the correctness of his former statement, not to throw doubt upon it.

Yundt also examined the brakes and was deceived in the same way. And then they both deceived *Pancoast*, as above stated. Finally, however, *Yundt* seems to have found out his error; for having been recalled, not by appellant, but by appellee, he then says that the brake on the Tyler car in 1845 *was* a double acting brake. pp. 630, 631.

The appellee next attempts to rebut this evidence by showing that one or two of our witnesses had on previous occasions either said nothing about this use of a double brake on the Camden & Amboy road, or had expressly denied any knowledge of such use. The most important of these witnesses is *Lockwood;* and those called against him are *Moies*, *Hubbell*, *Waterman*, *Tanner* and *Sayles*.

Moies, p. 498, says that he went to Bordentown, he thinks, in 1851, to introduce the *Hodge* brake; that he spent nearly the whole day with the Superintendent of car repairs, explaining to him wherein the *Hodge* was superior to any other brake, and that he said if this was true, he would do all in his power to introduce it. They said nothing about their having used double brakes on their road. All they said was, they did not believe much in double brakes.

Tanner, p. 536, says he saw *Lockwood* in '51, and showed him the model he had made of his *Turner* brake, which was the same as the *Tanner*, as already explained; that he talked with him two or three hours, and he declined to put on the *Turner* brake at that time, because they had arranged to put on the *Hodge*, and that he said nothing about such a brake having been used on the C. & A. in 1843 and after.

Sayles, p. 454, says that he called on *Lockwood* in 1852, to introduce the *Tanner* brake; that he said *Tanner* had already shown him the model, but they had arranged to use the *Hodge;* that if he had seen the *Tanner* sooner, he thought he should have recommended that; and much more we cannot repeat. That he saw *Lockwood* again in 1853, and he said he had never heard of any other double brake till *Hodge* came there some two or three years before; that he was there again a number of times, and the C. & A. finally paid him for his brake $1,350; that nothing was ever said about their having used any double brake before, except the *Hodge*. And again, that he asked *Lockwood* in 1867 if he was not mistaken in regard to the time when the double brake was put on the Tyler car, and why they settled with him if they had used the *Tanner* brake since 1843; that *Lockwood* said it was a good while ago, and it was possible he might be mistaken as to the time: and that their folks would rather pay two or three hundred dollars than be bothered with a law suit.

Waterman, p. 465, says that in 1859 he saw *Lockwood*, and he said that they commenced with double brakes with the *Hodge;* that they afterwards applied the centre lever. "That was the distinct *impression* made upon me."

And finally, *Hubbell*, p. 543, says that he saw *Lockwood* in 1860, and he could not tell him when they first used double brakes; and the nearest information he could get from him was about 1851. "*Lockwood* did not talk much; he answered how the brake was constructed, but did not seem to know really much about it, particularly as to the time when first used, and I did not rely much upon him, but sought to get the information from *Mr. Dripps.* He never said anything about the use of a double brake on the C. & A. prior to 1848."

Now all this might be true, and still leave the testimony of appellant's other witnesses unaffected. But most of it is not true.

Waterman never saw *Lockwood* at all. This is proved not only by *Lockwood's* own denial, but by another witness, *N. F. Smith*, who remembers *Waterman's* visit, and all the circumstances, and swears positively that *Lockwood* was not in Bordentown at the time, and in consequence *Waterman* had to refer his matters to *Van Rensellaer.* p. 363.

The manner in which the plaintiff sought to dispose of this is so characteristic that we give it at length.

"Mr. Smith says, if I recollect right, that Mr. Waterman was there in the fall of the year, and that Mr. Lockwood was away. Now, if the court please, I don't know, and I don't care, whether Lockwood was there in the fall of that year, or the fall of any other year or not. The case was tried in *June*, 1859, as the clerk's minutes show, and Waterman testifies he was at Bordentown and saw Lockwood, and had this conversation shortly *before* that trial took place. Now, I submit to the court, of what materiality is it what Waterman did or who he talked to *in the fall of* 1859,—months after that case had been tried? That, I think, is enough to say about Mr *Smith's* attempt to deny *Waterman's* statement. It is of a piece with everything they have done in this case."

The unfairness of this is at once apparent when we learn that *Smith* states expressly that it was *just previous to this trial* that *Waterman* came to Bordentown to see *Lockwood;* that he went to *Smith's* brother to get him to go *as witness in that trial*, and *Lockwood* being away, permission had to be obtained from *Van Rensellaer.* The time is thus fixed beyond dispute, and the mere fact that *Smith* thought it was in the fall, so much dwelt on by plaintiff, becomes of no importance. Moreover, *Waterman himself, the very witness the plaintiff is here trying to sustain, made precisely the same mistake.* He says, "I think it was sometime in *the latter part of* 1859, a short time previous to the trial at Canandaigua." p. 465.

Lockwood swears that "Waterman never called on me to my knowledge; but I understood a man did call to see me, and I was not in Bordentown; but when I returned, either from Tarrytown or Newburgh, I can't say which, my foreman, Mr. Smith, informed me that there had been a person there to see me in reference to car brakes; my not being present, Smith saw Mr. Van Rensellaer, and he gave his consent for Smith to go to Canandaigua, as a witness on a trial in reference to brakes." p. 380.

Tanner and *Sayles* are both interested parties, *Sayles* especially, who has testified in this case over and over again, and who has been contradicted every time. *Lockwood* flatly contradicts them both, and his unsupported word is in this instance better than both of theirs.

The statement made by *Hubbell* is wholly inconsistent with those of his fellow witnesses. *Moies* had had a long talk with *Lockwood* about the *Hodge* brake in 1851; *Tanner* another in 1851, when the brake was introduced. *Sayles* called on him in 1852, again in 1853 a number of times; then in 1854, and once more in 1855. Yet when *Hubbell* saw him in 1860, "he did not seem to know really much about the brake." p. 547.

Finally, this is "that most unsafe of all testimony, conversations and confessions—remembered or imagined—partly stated or wholly misrepresented." *Badger v. Badger*, 2 Wall. 93. It is evidence largely of interested witnesses—for if we throw out *Sayles* and *Tanner*, the others amount to little—of conversations that occurred ten to fifteen years before.

It may be said, however, that if the *Tanner* brake had been in use on the C. & A. road since 1843, *Lockwood* would have been sure to say so, and these witnesses to remember it. But that depends on the object these witnesses had in view. If *Moies* saw *Lockwood* at all, he went there simply as agent of *Hodge*, to introduce the *Hodge* brake. He was already familiar with the *Tanner* brake, though not by that name, and was firmly convinced of its great inferiority to the *Hodge*. It was to him therefore a matter of little moment whether the *Tanner* brake had been used on the C. & A. road in 1843 or not. There was no reason for *Lockwood's* telling him, and no reason why he should remember it if told.

The same is true of *Waterman*. All he wanted was to defeat the *Hodge* patent, or to show that it was no better than the *Tanner*, which he already knew was prior to it. It could not have aided him in the least as to either of these matters to know that the *Tanner* brake had been used on the C. & A. as early as 1843.

Hubbell, we admit, ought to have found out about this use, but it is not at all incredible that he should not. It is much easier to account for his failure than it is to explain how the twenty-five or thirty witnesses for appellant could be mistaken. As we have already said, there is something a little singular about this interview between *Hubbell* and *Lockwood*. To read *Hubbell's* statement, it would seem that *Lockwood* had very little knowledge of brakes of any kind. But this is out of the question. The only conclusion we can come to is that *Lockwood* did not happen at the time to be in a communicative mood, or his mind may have been occupied with other matters. It is not true that railroad men, any more than lawyers, are always ready to tell all they know to every stranger that seeks to interview them.

But again it may be urged in this connection that the Cam. & Am. would never have paid for the *Tanner* if it had been on that road since 1848. We do not know how this will strike the court, but no one who has ever had a share in the management of a railroad would give it a thought. Those unfortunates have been too long used to paying for patents that they fully believe to be invalid, to regard such an act as any admission to the contrary. Their experience has been too much like that detailed by *Dripps*, where the Cam. & Am. road spent thousands of dollars in the *successful* defense of a patent suit they could doubtless have settled for as many hundreds. p. 369.

So *Van Rensellaer* says that the President of the C. & A. settled for the *Hodge*, not acknowledging its validity, but to avoid litigation, *and that Lockwood objected to paying for this Tanner brake on the ground that it was already in use on their road.* p. 273. The court will remember that the date of the invention of a patent is almost always an unknown quantity; that the life and memory of witnesses are uncertain, and that the officers of a road who settle for a patent are not often the ones who have any personal knowledge of its prior use.

The remaining evidence for appellee on this point is of the strangest sort, and such as could never have been so much as thought of, except in a patent suit, where all the known rules of evidence are so constantly held for naught. This is the evidence of *Gifford*, *Grosvenor*, *Hubbell*, *Keller* and *North*, the attorneys engaged in the suits of *Tanner* against the Erie and Hudson R. roads, as to what was done in those suits to defeat the patent. It was chiefly hearsay, and except so far as it concerned the witnesses in the present case, *res inter alios acta*, and should never have been admitted into the suit, or only for the purpose of an injunction. But these witnesses have not only been allowed to tell what they did themselves, but everything that was told them by others. And to cap the climax, some of the defendant's lawyers in those suits, *who are now retained by the patentees*, are here asked to give their *opinions* as to our several defences, and it never seems to have occurred to any one that this evidence was not competent. But even admitting it to be competent, it is still of little weight. These parties failed to hit upon this Camden & Amboy brake, but what then? They profess to have been very zealous to defeat these suits, and perhaps they were. But both those suits were settled for small amounts, a thousand or two of dollars in each case; though if the amount had been a hundred times as great, the result might well have been the same. The court is familiar with the Hyatt patent for sidewalk lights, now so common in all our streets. That patent was granted in 1845; it was sustained by the courts; it was twice extended, in spite of vigorous opposition; it was a very valuable patent, having yielded at least a million dollars and probably twice that amount to its owners. In 1872, or 27 years after its issue, one of the defendants in a suit brought upon it went to London to see if he could not find a defense, though he knew that the same ground had been gone over before. He returned in about six weeks, bringing with him a large printed volume, well known

$1000. in one case
and $75 in the
other. p 496; 695.

in this country, containing some 25 descriptions of the device accompanied with drawings. He brought also a light which had been worn as thin almost as a knife by the millions of feet that had walked over it in London streets. He brought a trade circular containing page after page of descriptions and drawings, and a frontispiece showing the maker's shop on a corner in London with the lights in the sidewalk and leaning up against the front of the building. There must have been at least a hundred thousand people in London who had seen these lights a thousand times; the thing was far more notorious than this Camden & Amboy brake, parties had been to London expressly to hunt for it, and had come away without finding it.

Finally, the court below says "There is one fact established, which unexplained, seems to be conclusive on this part of the case. The counsel for the defense do not controvert the value or utility of the *Tanner* brake. Now if there was such a brake in substance or effect on the car referred to, then it was not attached to the other cars of the C. & A. road, because the proof appears ample that some years after 1843 the cars were run generally with the single brake alone, and if it were true that a double acting brake included in the model of the Tyler car, existed in 1843, it is scarcely possible to doubt that it would have gone into general use at once on the road." p. 67.

This argument, on which the court so largely relied, is plausible but wholly unsound. In the first place, as this court has said, "There is no force in the argument drawn from the wisdom that comes after the event." It is not safe to judge 1843 by 1875. Because the utility of double brakes is now generally proved and acknowledged, we have no right to assume that the same was true thirty years ago.

"Being schooled as we are now to the use of the double brake we would not consider it safe to depend on the brakeman running through the car, first applying the brake on one end, and then on the other; but we did consider it so, 18 or 20 years ago; that was the custom." Dep. of S. J. Hayes, p. 961.

But second, it is a still greater mistake to suppose that new improvements are so readily adopted as the above argument assumes. On the contrary it is oftener the work of years. The two greatest improvements ever made in railroading are the Miller platform and the Westinghouse brake. Yet it took years to introduce them even on the leading roads, and many are without them still. And twenty years after the double brake was known, many roads continued to use the single brake alone. Finally the very thing the court below thought so incredible is proved by the plaintiff in this case to have happened on two other roads. Batchelder, one of these pretended inventors, swears that he applied the *Tanner* brake on a car on the Fitchburg road in 1847, and that it worked to his entire satisfaction, p. 93. If the court below is correct, then this brake ought "at once to have gone into general use on that road." But the fact is that the Fitchburg road continued to use the single brake on all its other cars till 1851, when they adopted not the *Tanner*, but the *Hodge*, precisely as happened on the Camden & Amboy. In 1848 Batchelder swears that he applied it in like manner on the Boston & Lowell road, but there too they went on using the single brake till 1851, when they adopted the *Hodge*.

So too on the New Jersey road *Brown* says they put on the first double brake in 1851, but it was not till 1856 or '7 that they gave up the single brake. p. 868.

The fact is it takes long to satisfy the various officers of a railroad of the necessity of a change. For this there are many reasons. A thousand different so-called improvements are all the time being urged upon them. Some of these work well for months or years, and then develop defects before unseen. Or they work well, but are supplanted by something better. Or the officers, who alone have the power to make the change, are not aware of its necessity. The Master Mechanic must see the Superintendent, the Superintendent the President, and the President the Directors. It is often only after years of such consultations that the change finally comes. Nowhere in short is Paul's advice better heeded, to "prove all things, hold fast that which is good."

In conclusion we must say that it seems to us, this defense is fully made out. The evidence on the other side is all capable of full explanation. But there is no possible explanation of appellant's testimony, except on the theory of its truth. If the court will look again at the evidence of *Coulter*, *B. L. Walcott*, *J. C. Hillman*, *Chas. Cox*, we might add a dozen more, we think they will agree with us that if such a matter ever can be proved, we have proved it in this case.

III.

THE INFRINGEMENT.

There are three kinds of double brakes now and for the last 25 years in use, the *Tanner*, the *Stevens* and the *Hodge*. The *Tanner* is little used, most of the roads having preferred the *Stevens* or the *Hodge*. It is claimed, however, by the plaintiff that both of these are infringements of the *Tanner*, but this we wholly deny. The brake used by defendants is the *Stevens*, and that is the only one now before the court. We will first state what we believe to be the law, and then apply that law to the facts. We admit,

First. That two things may *look* very unlike, and yet be the same.

Second. That mere formal changes, changes that do not go to the substance of the invention, are not enough to avoid infringement.

Third. That to use the *principle of an invention* is an infringement, no matter what *formal* changes may be made.

Fourth. That no one has a right to use the patented device, no matter what improvements of his own he may add to it.

But on the other hand we say,

First. That the *principle* of a machine or a combination is not an *abstract idea*, but only that idea when embodied in a visible shape.

Second. If there can be no patent for an abstract idea, of course there can be none for a result. And if none for a result, then none for *all ways* of producing that result. Anyone has a right to produce the same result, provided he employs different means. It is the *specific means* employed, or their equivalent, that is patented; and unless we use those means there is no infringement.

"The word '*principle*' is used by elementary writers, and sometimes by courts, with such a want of precision as to mislead. It is admitted that a principle is not patentable." *LeRoy v. Tatham*, 14 How. 174.

"The end to be accomplished is not the subject of a patent. The invention consists in the new and useful means of obtaining it." *Carver v. Hyde*, 16 Pet. 519.

"The patent embraces nothing more than the improvement described and claimed as new; and any one who afterwards discovers a method of accomplishing the same object, substantially and essentially differing from the one described, has the right to use it." * * "The patent confers the exclusive right to use the means he specifies to produce the result or effect he describes, and nothing more." * * "And any one may lawfully accomplish the same end without infringing, if he uses means substantially different." *O'Reilly v. Morse*, 15 How. 119.

"The patentee is protected against any other device which involves substantially the same principle. But if another produces the same result by means different in principle and application, it is no infringement; for it would be absurd to say that a patent covers all possible ways of producing the same result." *Lee v. Blandy*, 2 Fish. 95.

"There cannot be a patent for a principle; nor for the application of a principle; nor for an effect. Two persons may use the same principle, and produce the same effect by different means, without interference or infringement, and each be entitled to a patent for his own invention." Bain v. Morse, Law's Dig. 259.

"We find here no authority to grant a patent for a "principle," or a "mode of operation," or an idea, or any other abstraction. A machine is a concrete thing, consisting of parts, or of certain devices and combination of devices. The principle of a machine is correctly defined to be its mode of operation, or that peculiar combination of devices which distinguish it from other machines. A machine is not a principle, or an idea. The use of ill defined abstract phraseology is the frequent source of error." *Burr v. Duryee*, 1 Wall. 570—578.

See also *Case v. Brown*, 2 Fish. 273, 2 Wall. 327; *Stone v. Sprague*, 1 Story, 270; 2 Robb. 10; *Singer v. Walmsley*, 1 Fish. 563-9; *Amer. Pin Co. v. Oakville Co.*, 3 Blatch. 192; *Werner v. King*, Off. Gaz. 13, 178.

Third. There can be no infringement of a combination unless all the parts are used, or their equivalent. *Prouty v. Ruggles*, 16 Pet. 341; *Brooks v. Fiske*, 15 How. 219; *Vance v. Campbell*, 1 Black, 429; *Eames v. Godfrey*, 1 Wall. 80; *Rich v. Close*, 4 Fish. 283; *Case v. Brown*, 2 Ib. 274.

"The defendants do not infringe, for the combination which they use is not Shaw's combination. It discards one of Shaw's elements, as he has described them, and includes a device not found in Shaw's combination, which performs, in the defendants' machine, a function not performed by any device in Shaw's." *Knox v. Martha*, 5 Fish. 181.

Fourth. And even though all the parts are used, yet if they are *arranged and combined* in a substantially different way, there is no infringement.

"The use of any two of these parts only, or of two combined with a third, which is substantially different in form, or *in the manner of its arrangement and connection with the others*, is therefore not the thing patented." *Prouty v. Ruggles*, 16 Pet. 341.

"If either the devices or *the mode of applying them* in any other machine, is substantially different from the plaintiffs, it is not the same." *Eames v. Cook*, 2 Fish. 148; *Carver v. Hyde*, 16 Pet. 513; *Singer v. Walsmley*, 1 Fish. 578, 582; *Case v. Brown*, 2 Ib. 274; *Stimpson v. The Railroad*, 10 How. 345; *Eames v. Godfrey*, 1 Wall. 80; *Seymour v. Osborn*, 11 Wall. 555.

Fifth. There can be no infringement unless the two machines employ the same means—operating in the same way—and producing the same result. All of these things must be proven to make out that substantial identity that constitutes infringement. *Cahoon v. Ring*, 1 Fish. 419; *Foss v. Herbert*, 2 Ib. 85; *Eames v.* Cook, Ib. 148–151; *Cox v. Griggs*, Ib. 178: *Westlake v. Carter*, 6 Ib. 525, 6, and *Burr v. Duryee*, 1 Wall. 572, 3, are all very clear on this point. See also, *Smith v. Downing*, 1 Fish. 83; *Many v. Sizer*, Ib. 24; 40–43; *Page v. Ferry*, Ib. 314; *Morris v. Barrett*, Ib. 464; *Blanchard v. Putnam*, 3 Ib. 196; *Conover v. Roach*, 4 Ib. 26; *Conover v. Rapp*, Ib. 62; *Carter v. Baker*, Ib. 408; *Merriam v. Drake*, 5 Ib. 263.

Sixth. The result here spoken of is not the same *general* result, but the *specific* result.

"It is true that the general object of the two is the same, and so it is with all rival inventions. But this of course does not necessarily make all new inventions or patents for like objects an encroachment on all previous ones. Such a doctrine would discourage progress rather than encourage useful arts, as the constitution wishes to be done by granting patents. It would, after one invention as to the same subject, principle, or art, halt and bar all further advances on the same subject." *Smith v. Downing*, 1 Fish. 84.

"By an abuse of this doctrine of equivalents, experts may demonstrate every machine which effects a certain purpose to be the same with every other that effects the same purpose." *Sickles v. Gloucester Man. Co.*, 1 Fish. 284.

Seventh. There is no infringement if the difference, whether in the means employed—or in the mode of operation—or in the result, *involves invention*; unless the difference consists solely in some *addition* to the plaintiff's machine; retaining all that was his, and adding something more. *Pitts v. Wemple*, 2 Fish. 19; *Foss v. Herbert*, Ib. 36; *Case v. Brown*, Ib. 272, 5; *Rich v. Lippincott*, Ib. 5; *Carter v Baker*, 4 Ib. 407, 416; *McCormick v. Seymour*, 2 Blatch. 245; *Blanchard v. Beers*, Ib. 420.

" Such an alteration is not a mere formal alteration, *as the difference between the two improvements is such that the new combination would be the proper subject of a patent*, and consequently would avoid the charge of infringement in a case like the one supposed by the court." *Gould v. Rees*, 15 Wall. 193.

Eighth. There is an important distinction here between *addition* and *substitution.* If I add something to the plaintiff's invention, I infringe, even though my addition be also patentable. But if I leave out a part of his combination, and substitute something of my own, constituting a patentable improvement, there is no infringement.

" If an improvement can be made by one skilled in the art without invention, then the one is substantially the same as the other. " But if he is obliged to go to invention, then he has a right to the benefits of whatever he thus invents; and if his invention is a *substitution* for the original invention, then it is not substantially the same, and he does not use it. But if he merely invents something to be *added* to it, then he cannot take the original invention, because he has made something distinct to add to it, as a new improvement." *Johnson v. Root*, 1 Fish. 364, "Adding and improving as much as they may, if defendants have taken plaintiff's combination they are liable for the use of that. It is true there may be a distinction of another kind; if a defendant does not *add*, but *makes a change*—improves one part of the machinery used—he may do that, and not be liable in the common acceptation of the term; and it might not be considered as a separate and additional improvement, but a change which is made by itself." *Colt. v. Mass. Arms Co.*, 1 Fish. 125. See also *Pitts v. Wemple*, 2 Fish. 18, 19, just cited; *Eames v. Godfrey*, 1 Wall. 80; *Gould v. Rees*, 15 Wall, 194, and *Richardson v. Noyes*, Off. Gaz. 10, 508; *Potter v. Holland*, 1 Fish. 390–2, where this point is very fully presented.

Ninth. This furnishes us with the safest and most exact definition of an *equivalent.* It is what can be substituted without invention, by the ordinary skill of mechanics.

Tenth. It is not enough for the plaintiff to show that the thing substituted is an equivalent; *he must also show that it was well known at the date of the patent as a proper substitute for the one omitted. Roberts v. Harnden*, 2 Cliff. 504; *Gould v. Rees*, 15 Wall. 194, and cases there cited; *Gill v. Wells*, 22 Wall. 28, 32. *Tafts v. Boston Mach. Co.*, Off. Gaz. 8, 240. *Union Sugar Ref. Co. v. Matthiessen*, 2 Fish. 629; *Fuller v. Yentzer*, 4 Otto. 297. And the same has long been the rule in England.

Eleventh. Increased utility is evidence tending to show that there is no infringement. *Many v. Sizer*, 1 Fish. 24; 40, 41; *Johnson v. Root*, Ib. 362; *Eames v. Cook*, 2 Ib. 149; *Woodman v. Stimpson*, 3 Ib. 98. *Mitchell v. Tilghman*, 19 Wall. 418.

The whole law on this question may be summed up as follows: There can be no infringement of the plaintiff's combination, unless we use all its parts, or their equivalents. And the parts used by us are not equivalents unless well known as proper substitutes at the date of his patent. Nor unless they are combined in the same way—and operate in the same way—and produce the same specific results. Nor unless they could have been substituted by the ordinary skill of mechanics, without invention.

Now there is not one of the above rules but what is settled beyond question. And there is not one of them but what must be disregarded in order to find infringement in this case.

Thus defendant's combination is different—its parts are different—their arrangement, connection and results are all different; and finally all these differences are beyond question substantial and material; they constitute a patentable invention—that invention has been patented, and the patent has been sustained by this court—we have a license under it, and it is by virtue of that license we have used the *Stevens* brake. If we have used anything that legally belongs to the plaintiff we are willing to pay him for it; but we deny that we have done this—we insist that we are here acting under an independant invention, and we claim its protection, as the courts have said we may do. *Westlake v. Carter*, 6 Fish. 526; *Corning v. Burden*, 15 How. 271; *American Pin Co. v. Oakville Co.* 3 Blatch. 192.

And finally the burden of proof is here upon the plaintiff, and every doubt is to be resolved in favor of defendent. *Many v. Sizer*, 1 Fish. 22; *Brooks v. Jenkins*, 3 McLean, 432; *Washburn v. Gould*, 3 Story, 142; *Cahoon v. Ring*, 1 Fish. 403.

We come now to compare the two machines. In Batchelder and Thompson's original petition, specification, and oath the invention is said to be "an improvement upon the car brake now in general use;" in the new specification, "a new and useful *mode of operating* the brakes of railway cars;" and in the patent, "a new and useful improvement in railroad car brakes." The specification, after describing the invention, and disclaiming the mode of applying all the brakes at once, as patented by Griggs in 1839, concludes as follows:

"BUT WHAT IS CLAIMED BY US IS TO SO COMBINE THE BRAKES OF THE TWO TRUCKS WITH THE OPERATIVE WINDLASSES OR THEIR EQUIVALENTS, AT BOTH ENDS OF THE CAR, BY MEANS OF THE VIBRATING LEVER A′, OR ITS EQUIVALENT, OR MECHANISM ESSENTIALLY AS SPECIFIED, AS TO ENABLE THE BRAKEMEN BY OPERATING EITHER OF THE WINDLASSES, TO SIMULTANEOUSLY APPLY THE BRAKES OF BOTH TRUCKS, OR BRING OR FORCE THEM AGAINST THEIR RESPECTIVE WHEELS, AND WHETHER HE BE AT THE FORWARD OR REAR END OF THE CAR."

Or more briefly, "COMBINING THE TWO SETS OF BRAKES AND WINDLASSES, BY MEANS OF THE VIBRATING LEVER A′, OR ITS EQUIVALENT, SO AS TO APPLY ALL THE BRAKES AT ONCE FROM EITHER END."

Now whatever else the inventors *might* have claimed, what they have claimed is certainly clear. This is not a claim for a double brake generally; that is, for any and all kinds of double brakes; as seems to have been supposed by the court below; nor is it, as insisted by the plaintiff, a claim for any and all modes of combining the brakes by means of an "*intermediate lever connection*"; but it is simply a claim for combining them by means of the *vibrating lever A′, or its equivalent.*" This lever, as their own expert declares, is the "*controlling element.*"

Whether they invented anything more than this, or whether they might have had a broader claim, is not necessary to inquire. All that the public are required to do is to take the claim as they find it. And any one reading this claim would have a right to conclude that all the inventors meant to claim was the means specified; viz., *the vibrating lever A′, or its equivalent*, and that every other mode he was at entire liberty to use. As this court has said in a recent case, *Keystone Bridge Company v. Phœnix Iron Company*, "When a claim is so explicit, the court cannot alter or enlarge it. * * When the terms of a claim are clear and distinct (as they always should be) the patentee is always bound by it. He can claim nothing beyond it." And so in *Merrill v. Yeomans*, 4 Otto 573.

With such a precise and definite claim, then, we think there should have been no difficulty in settling this question. The single point was this, Did defendants use the vibrating lever A′ or its equivalent? But our misfortune is that the learned judge who heard the case below seems at times to have entirely lost sight of this. True he refers to the claim in one part of his opinion, but he nowhere undertakes to point out this equivalent. And in another part of the case he evidently goes on a very different theory. Thus in his second interlocutory decree he says "that the thing patented and covered in and by the said letters patent is the combination of all the brakes of a car with the windlasses, so that the brakeman, by operating either of these windlasses, can apply simultaneously all the brakes. p. 34—35.

And in his second opinion, "According to the view which the court takes of the evidence, Bachelder & Thompson first successfully combined the two systems of brakes with each other and with the windlasses, so that all the brakes could be applied at either end of the car. *This was their invention, secured by letters patent to Tanner.*" p. 69.

We respectfully submit that this is not a correct view of the law. Whether they were first in the field or not, the inventors never could have had a claim for "combining the two sets of brakes with each other and the windlasses, so as to apply all the brakes at either end of the car." The most they could have claimed in any event was their specific devices or their equivalents. Subsequent inventors like Stevens would still have an undoubted right to do the same thing, provided they did it in a substantially different way, or by substantially different means. But much more is this the case when, as we have just seen, the inventors, confine themselves by the very words of their claim to "the vibrating lever A′ or its equivalent."

The rest of the opinion of the learned judge is what would be expected from such a construction of the claim. He gives us no analysis of either patent, nor does he anywhere inform us in what the infringement consists. We are simply told, in one place, that *Stevens* has taken the *inventive principle* of the *Tanner* combination, and evolved something different and better by additional devices; in another, that the only question is whether the Stevens brake *embodies the Tanner invention.*

We cannot protest too strongly against this mode of dealing with a great and important question. It strikes us as at once unsafe, unjust and unsatisfactory. It is very easy to say that one machine "*embodies the invention of another,*" or "*contains the inventive principle of another,*" much easier than it is to analyze the two machines, and point out those parts in the one which answer to those in the other. But this very ease is what makes it so unsafe. If the learned judge had gone on to point out in the Stevens an equivalent of the Tanner centre lever, his well known learning and experience would, we believe, have brought him to a very different conclusion.

The view taken by the court below is still farther obscured by what is said in other parts of the opinion. Thus we are first told that the case is to be decided according to the rule in *McCormick v. Talcott*, 20 How. 402. But the rule there laid down is, that "the inventor of the first improvement cannot invoke the doctrine of equivalents to suppress all other improvements which are not mere colorable invasions of the first." According to this view, therefore, the Stevens is "*a mere colorable invasion*" of the Tanner, a proposition we cannot believe the court meant to assert, and which we cannot be seriously called to refute.

A little further on we are referred to *Seymour v. Osborne*, as ruling that "inventors of a combination are as much entitled to suppress every other combination of the same ingredients to produce the same result not substantially different from what they have invented and patented, as any other class of inventors; and they have a right to invoke the doctrine of equivalents to that extent to sustain their invention."

But the rule in *Seymour v. Osborne* further is that "the inventor of a combination cannot treat anyone as an infringer whose machine does not contain all the material ingredients of the prior combination, as in that state of the case the subsequent invention is regarded as substantially different from the former one, unless the latter machine employs as a substitute for the ingredient left out to perform the same function, *some other ingredient which was well known as a proper substitute for the same when the former invention was patented.*" And that inventors of a combination have, as well as other inventors, "*the right to suppress every colorable invasion.*" p. 556.

From this it would seem that the court either mistook the rule in *Seymour v. Osborne* or else meant to decide that the Stevens combination had all the ingredients of the Tanner, or well known substitutes; a proposition impossible to be maintained, as we shall presently show.

We come next to the argument of the patentees. They admit in the outset that they are not entitled to claim *all modes* of combining the two sets of brakes. They are well aware that neither the law nor the claim would allow them to go to that extent; they have been compelled therefore to seek out some narrower construction, which, while seemingly more in accordance with the law, should yet be broad enough to embrace the Stevens brake.

The construction they finally settled upon was this: that the patent "COVERED ANY MECHANISM WHICH CONNECTS THE BRAKES OF THE TWO TRUCKS WITH THE WINDLASSES, SO AS TO PRODUCE THE RESULT STATED, BY MEANS OF A CONNECTION—BY WHATEVER ARRANGEMENT OF LEVERS—LOCATED INTERMEDIATELY BETWEEN THE BRAKE SYSTEM AND THE WINDLASSES SUBSTANTIALLY IN THE MANNER SET FORTH."

That is, to state it more briefly, they now claim "ANY INTERMEDIATE LEVER CONNECTION SUBSTANTIALLY AS SET FORTH."

Now we submit that this mode of stating their claim does not help the matter at all, except so far as it tends to mislead. It is a mere form of words which, whether intended to have that effect or not, simply obscures what before was perfectly plain. For it is clear that the patentees have no more right to claim *all modes* of combining the brakes by means of an "*intermediate lever connection*" than they have to claim *all modes* generally. Inserting these words, therefore, in place of those found in the claim, viz., "*by means of the vibrating lever A′, or its equivalent*," strikes us as nothing more or less than an evasion. It certainly implies, even if it does not directly assert, that *any* intermediate lever connection is an infringement. If that is not its meaning, why make any change in the claim?

It is no answer to this to say that they claim this intermediate lever connection only substantially as described. For if that is what this new claim means it means nothing. If we use the device substantially as described we infringe, and there is an end of it; there is no need of saying anything about an "intermediate lever connection." If we do not use substantially the same device, we do not infringe, whether we use an "intermediate lever connection," or any other. Admitting, however, the right of the patentee thus to construe the claim it only makes our case the stronger; for it is very certain that whatever else we use, we do not use any "intermediate lever connection" whatever to combine the two sets of brakes. The patentees indeed assert the contrary, as their own construction of the patent of course drove them to do, but when the court comes to see the position they have here to assume, its entire absurdity will we think become apparent at once.

Cooper, their sole expert on this part of the case, at first says that he is "clearly of opinion that the *Stevens* patent *embodies the invention* claimed in the *Tanner;* all the brakes in the *Stevens* are applied by operating either windlass as in the *Tanner*, the center lever is dispensed with, for the reason that the power is applied directly to the brake levers, and by them is transmitted to the other truck; the brakes of the two trucks are connected by means of rods in such a manner that all that is performed by the *Tanner* is also accomplished by the *Stevens;* the difference is one of form and not of essence up to the point when the *Tanner* invention ceases, and the *Stevens* begins." p. 106.

But he is very careful not to tell us where that point may be found; if he had, we should have seen at once that it was an abstraction merely, an imaginary point incapable of any local habitation, and becoming a vanishing point the moment we try to seize it. So he tells us that the Stevens brake "*embodies* the Tanner invention," that most vague, plausible and convenient formula when one wishes to prove one thing to be an infringement of another, and does not know exactly how to do it. Being asked, however, on cross examination, to state his reasons, he at last comes out with this truly astounding statement, astounding even for an expert, that *the equivalent of the Tanner centre lever is to be found in the Stevens in one of the brake levers!*

Whatever may be thought of this ingenious theory, it has at least this merit, that it reduces the question of infringement to the briefest compass, and presents it in the most definite, tangible shape. What we had most to fear, in fact, the only thing we had to fear was that the matter might be left in the same vague, shadowy condition in which it was left by *Cooper* on his direct examination, and in which, as we have just seen, it was left by the court. The question now is simply this, Is the equivalent of the Tanner centre lever to be found in any one of the Stevens brake levers? We say as to this that it is not an equivalent; for it is combined and arranged in an entirely different way—it operates in an entirely different way—it was intended to produce and does produce entirely different results—it could not have been made without invention—it has never been pretended that it was a substitute well known at the date of the plaintiff's patent—in short it would be hard to find two things more totally unlike.

If we look now at the Tanner brake we shall find its parts combined as follows. The power is first communicated from the windlass by means of its rod and chain to one end of the centre lever A'. There the power is divided, part being sent back to the brake lever in the nearest truck, and the rest sent forward to the brake lever in the farther truck. There are thus five elements which serve to combine the windlasses with each other and the two sets of brakes; viz: the two rods running from the windlasses to the centre lever—the centre lever itself—and the two rods running from it to the brake levers. The centre lever is here, as said by Cooper, the "*controlling element.*" p. 116.

This centre lever is not a brake lever; it is not even a part of the brake mechanism proper; but a separate and distinct device, added to the brake mechanism for the sole purpose of receiving, transmitting and increasing the power. Or, as described and claimed in the patent, it is the means employed to connect the two sets of brakes. Or, to adopt the language of the patentees in their construction of the claim, it is the "intermediate lever connection." In whatever way we look at it, it is *an extra device outside of the brake levers.*

In the Stevens, on the contrary, the levers are all brake levers, and nothing but brake levers. They are all just alike. There are two in each truck, instead of one as in the old single brake and the Tanner; but this new lever is still as much a brake lever as the old one. It is not in any sense a centre lever. It is to that extent; they have been compelled therefore to seek out some narrower construction, which, while seemingly more in accordance with the law, should yet be broad enough to embrace the Stevens brake.

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It is no answer to this to say that they claim this intermediate lever connection only substantially as described. For if that is what this new claim means it means nothing. If we use the device substantially as described we infringe, and there is an end of it; there is no need of saying anything about an "intermediate lever connection." If we do not use substantially the same device, we do not infringe, whether we use an "intermediate lever connection," or any other. Admitting, however, the right of the patentee thus to construe the claim it only makes our case the stronger; for it is very certain that whatever else we use, we do not use any "intermediate lever connection" whatever to combine the two sets of brakes. The patentees indeed assert the contrary, as their own construction of the patent of course drove them to do, but when the court comes to see the position they have here to assume, its entire absurdity will we think become apparent at once.

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In the Stevens, on the contrary, the levers are all brake levers, and nothing but brake levers. They are all just alike. There are two in each truck, instead of one as in the old single brake and the Tanner; but this new lever is still as much a brake lever as the old one. It is not in any sense a centre lever. It is not an added device outside of the brakes; it is itself a part and parcel of those brakes. It is not the connection, but is itself a part of one of the things to be connected. It does not answer to the claim even as modified by the patentees, for it is not an "intermediate" lever connection. It is in no sense "intermediate" between the two sets of brakes, or between one set of brakes and the windlass.

But again, let us look at this brake lever if we can as something apart from the brakes, still it does not answer to the Tanner centre lever, for it does not connect the two sets of brakes, that is, it does not do the very thing the centre lever was designed for. It receives the power from the windlass, applies a part to its own pair of wheels and passes on the rest to the other lever in the same truck. It does not transmit any portion of the power to the other truck, for it is not connected with that truck. That has to be done by the other lever from which the long rod runs to the other truck. Thus it takes both the brake levers in one truck to connect the windlass with the other truck. And if the power is applied from the other end, all this is reversed; so that to make this pretended connection it takes sometimes the two levers in one truck and sometimes the two in the other. And in either case it takes *all four* of these levers to connect the two *windlasses*.

Again, the Tanner centre lever is pivoted to the bottom of the car, while the Stevens brake levers are hung each one to its own brake beam. This difference is very important.

1st. These two modes of attachment cannot be changed the one for the other. The centre lever would be wholly useless if hung to the brake beam, and so would the brake lever if pivoted to the bottom of the car.

2d. In the Tanner it may well be claimed that the *bottom of the car* is an essential element in the combination, while it is not so used in the Stevens.

3d. The centre lever being pivoted to the bottom of the car has but one motion, viz. a vibrating motion on its pivot; while the Stevens brake lever has three motions, viz. a vibrating motion on its pivot, a swivelling motion with the truck, and still a third motion with its brake beam, to and from the wheels; and all these motions are essential to its operation.

Again, the Stevens brake lever was not intended at all for the same purpose as the Tanner centre lever. These added levers in the Stevens were intended solely to remedy a serious defect that existed in the old single brake, and also in the Tanner. In both these brakes, owing to there being but one lever in the truck, far more power is applied to one set of wheels than to the other. Thus, suppose the upper arm of the lever to be twice as long as the lower, if now we apply a force of 100 pounds to the upper end we shall have a pressure of 200 pounds on one pair of wheels and 300 pounds on the other. Hence one pair of wheels will slide sooner than the other; and as it will not do to slide the wheels, we are compelled to apply much less force than if it were equally divided.

To remedy this defect Stevens added his second lever in each truck, and then combined the two by a short rod running from one lever to the same point in the other lever, thus obtaining an equal pressure on all the wheels in one truck. This was the first improvement made by Stevens, and was an improvement simply on the old single brake. It had nothing to do with the connection between the two sets of brakes; that had to be provided afterwards, and was provided by wholly different means, as we shall presently see.

Again, no one has ever said or dared to say that this brake lever of Stevens was a proper and well known substitute for the Tanner center lever at the date of the Tanner patent. Yet unless it was such a substitute, it was no infringement. The burden of proof too is here upon the plaintiff, he is bound to prove infringement, and he is bound of course to prove all that goes to make up that fact.

> "If the claim is valid defendants are not proved to have infringed it, for there is no evidence in the record tending to show that the contrivances used by defendants were at the date of the patent known substitutes for either of the means of adjustment described in the patent." *Tufts v. Boston Machine Co.*, 8 Off. Gaz. 240; Shepley, J., 1875.

Now there is not a word of such proof in this case, nor could there be. The brake lever as found in the Stevens never was known as a proper substitute for the centre lever; never was known at all in fact until long after the alleged invention of Batchelder & Thompson.

The differences above noted are special. We come now to a difference of a more general character, applicable not only to the comparison just made between the centre lever and the brake lever, but also to any broader comparison that may be made between the two machines.

The Tanner centre lever is pivoted to the bottom of the car by a bolt passing through the floor timbers, on which bolt the lever revolves. This bolt thus constitutes a rigid or fixed fulcrum for the centre lever, and it is to the existence of this fixed fulcrum that the chief merits and demerits of the Tanner brake are due. The court will see from the drawings, and still better by working the model, that this fulcrum furnishes the point of resistance against which the power of the windlass is exerted. Consequently by winding up the slack of the chain on one windlass we can apply the brakes without reference to the state of the other windlass. We do not pull against the other windlass at all, nor are we obliged to take up any of its chain. That chain may be entirely loose and yet the operation of the working windlass be entirely unaffected. Nay more, we may even disconnect the rods that run from the centre lever to the windlass and brakes at one end of the car, and yet apply the brakes at the other end the same as before, thus making of it one single brake. Or we may even leave out one windlass and the rod running from it; and thus have a double brake, but capable of being worked only from one end.

In the Stevens, on the contrary, there being no such fixed fulcrum, the point of resistance of the one windlass is only found in the other. The force runs way through from one windlass to the other, and has nothing to bring up on till it reaches the other. In other words the windlasses pull against each other, instead of pulling, as in the Tanner, against the fixed fulcrum of the centre lever. The Stevens is thus seen to be a unit in which every part is necessary to the operation of every other part. By connecting one of the brake levers on one car to the corresponding lever on the next car, all the brakes on both cars can be operated from one windlass; and so on through the whole train; only in practice there would be too much lost motion to make the brakes effective.

Now the advantages due to this novel arrangement in the *Stevens* are very great. It is owing largely to the absence of this fixed fulcrum that the *Stevens* brake has superseded the *Tanner* on so large a proportion of our roads. A brake should apply an equal pressure on all the wheels; not only in one truck, but in both trucks. If the pressure is unequal some of the wheels may slide, while on the others the brakes produce very little effect. But sliding the wheels is bad for two reasons; first it is apt to wear a flat place on the wheels (commonly called "spotting"), and second, a wheel when sliding is thought not to exert so much power towards stopping the train as just before sliding. Hence the best brake, other things being equal, will bring all the wheels as nearly as possible to the point of sliding at the same time. Now if all brakes could be perfectly adjusted, and remain so; if the rods and levers always remained of the same length and in the same relative position; if the wheels were perfectly round and true on their centres; and if the brake shoes always wore evenly; in short, if all the parts of the whole, complex machine, a heavy railroad train, and its trucks and brakes, could be kept in the right relation to each other while flying over the track at thirty miles an hour, and in spite of the repeated and violent strains upon them while being brought to rest, then one brake would be, so far as this matter is concerned, about as good as another. But this is not the case, the rods and levers will not remain the same; the turn buckles on the rods will wear loose and turn the wrong way, the trucks will shift their position according to the way the car is running, the break shoes will wear very unevenly; and the consequence is that a brake which is not self-adjustable may start out in the morning all right, and after running fifty miles or twenty, or even ten, may get so far out of order as to apply the power chiefly on one truck, or wholly on one truck and not at all on the other.

This is the one great defect in the *Tanner* brake, and it is due solely to this fixed fulcrum in the centre lever. It has no self adjustability. If the rod that runs from the centre lever to one truck happens to be a little shorter than the rod running to the other truck, the short rod will, of course, apply the brake on that truck, while the brakes in the other truck will remain loose; and the same thing will happen if the brakes' shoes in one truck wear faster than those in the other. The only help for this is to re-adjust the brake by hand.

In the *Stevens* brake on the contrary, there being no fixed fulcrum, the power is the same on both trucks, and remains the same in spite of the wearing of the shoes or the changes in the rods and trucks.

E. S. Renwick, one of patentee's experts, says "If the brake is in the best possible condition in each case, there is no appreciable difference between the two; but the *Hodge* arrangement permits of a considerable variation in the brake shoes and connections by wear and otherwise, without materially varying the equality of distribution between the two trucks; this difference in result being due to the fact that *in the Tanner system the fulcrum of the centre lever is fixed*, while in the *Hodge* brake the *fulcrums of the two cross levers are movable*, and adjust themselves to variations in the brake-shoes and in the connections." p. 945.

But the *Stevens* and the *Hodge* are both alike in this, neither having any fixed fulcrum; and both possess this advantage over the *Tanner*.

Waters, another of patentee's experts says: "The advantage of the Hodge over the Tanner consists in the fact that there is no relative adjustment to be maintained in the brake connections. The levers used in the Hodge contrivance between the windlasses and the brake levers *having no connection with the body of the car*, float into the position required, so as always to produce an equal strain upon each of the two trucks when the brakes are set up. This will not be the case in the *Tanner* brake unless the connection from the central lever to the truck levers are adjusted to a suitable length—the one with the other. In consequence of this difference, the *Hodge* brake will bear much greater neglect of adjustment than the *Tanner* brake." p. 716.

So the plaintiff's expert, *Cooper*, in trying to show that the *Millholland* brake differed substantially from the *Tanner*, says that there is no elasticity in the Millholland, "*all the pivots being rigid;* if a single shoe were worn or lost, all the force applied would be expended on a portion of the brakes, and in my opinion the brake could never be a practical one." "The chief defect in my opinion arises from the fact that the brake levers are also pivoted rigidly to the trucks; whereas in the *Tanner* they are suspended loosely from the truck, which gives an entire self-adjustibility to the latter. And if the brake (*Millholland*) were so adjusted, any unequal wear such as occurs constantly in railroad brakes, would throw it out of adjustment—throw all the strain on some of the wheels, and leave the others free." pp. 107, 108, 115.

Now this all-important advantage which according to *Cooper* the *Tanner* has over the *Millholland* in having no fixed fulcrum to *its brake levers*, the *Stevens* has over the *Tanner* in having no fixed fulcrum *between the trucks.* In other words, that self-adjustability which the *Tanner* has only as to the brakes in each truck by itself, the *Stevens* has in the trucks, and also between the trucks.

It is impossible to deny that this difference exists, or that it is material and substantial, for both these facts are proved by the plaintiff's own witnesses and also by the models. If then we should admit that all the parts in the *Tanner* were to be found in the *Stevens*, there would still be no infringement, for we must not only use the same elements, but those elements must be arranged and combined in the same way and so as to produce the same results.

The case of *Carver v. Hyde*, 16 Pet. 519, already cited, is here strikingly in point. The invention there was a new form of "*rib*, to be used in a cotton gin," and this "*rib*" had of course to be connected in some way with the other machinery. If we apply that decision to the present case, it will read as follows:

"The invention here in question is not an invention to be used by itself, but it is an improvement on the old brake, and that improvement consists in the means employed to effect the combination of the two sets of brakes; and it is to be used in connection with the other parts of a machine, viz., a railroad car, which has been long publicly known and used. This brake has in some way to be connected to the car: and the effect produced by it necessarily depends in a great degree upon the mode in which it is arranged and connected with the car and other parts of the machine. The patentees specify the mode, viz., the centre lever pivoted to the bottom of the car, and claim it as part of their invention. If then Stevens has by a lever of a substantially different form, *or differently arranged with the car, or not fastened at all to the car*, made an improvement which more effectually secured the object intended to be accomplished by the plaintiff's patent, it would be difficult to maintain that it could not be lawfully used because it produced the same result with the plaintiff's invention."

The argument of the patentees is that because the *Stevens* brake applies all the brakes at once by means, as they pretend, of an "intermediate lever connection," therefore it is an infringement, no matter what else may be added to it or taken from it. But this argument finds a complete answer in the case just cited. We do not admit that there is in the *Stevens* any lever connection, but if there is, it is too plain for proof that that lever is not fastened at all to the car; that it is arranged and combined in a totally different way, and attended by very different results.

There is another way of presenting this question of infringement in a very brief compass which yet makes it, if possible, still plainer than the last. It consists in showing how differently the two inventions were made. All that was done in the *Tanner* was to take the old single trucks and connect them by means of the centre lever. *Stevens* proceeded in a very different manner. He began at an entirely different point, and went on in an entirely different path. His first step was to add a second brake lever in each truck of the old single brake, for the purpose of equalizing the pressure on the wheels *in the truck*. He thus made his first improvement, an improvement, namely, on the old single brake. If now he had gone on to combine these two improved single brakes by the same means used in the *Tanner*, viz., a vibrating centre lever, it would have presented a very different question. In that case he would have had all there is in the *Tanner*, and this first improvement of his own besides. It would have been a clear case of addition. The court below might then well have said that the device "embodied the plaintiff's invention"—that *Stevens* had taken the inventive principle of the *Tanner* combination, and evolved something different and better by additional devices."

But this *Stevens* did not do. Having made this first improvement, he then went on to make another still more important. He might have retained the centre lever perfectly well, as the court can see at a glance from the handy model here offered in illustration. Fig. 8. But by so doing he would have lost the chief advantage of his brake over the *Tanner*. He therefore wisely rejected the center lever, and substituted the single straight rod which is the only thing that really connects his two sets of brakes. He could do this, though *Tanner* could not. By having two levers in each truck he was able, first to apply the power from the windlass to the brake levers in one truck, and then to transmit the power by his straight rod to the other truck. His second improvement thus sprang directly out of his first. His improvement in the old single brake enabled him to connect the two trucks in a far simpler and better way than was possible with the *Tanner*, in which the old single brake remained unchanged. And if anything can be plain, it is that this second or greater improvement was gained not by *adding* anything to the Tanner, but by putting his rod in place of the centre lever. It is a clear case of substitution.

This model, which we have called the "Tanner-Stevens" brake, shows also in another way how absurd it is to call the brake lever an equivalent of the centre lever. The brake levers in this model perform precisely the same function that they do in the Stevens brake. But it is clear that they do not here connect the two sets of brakes—that is done, as it is in the Tanner, by the centre lever. But if they do not connect the brakes in this model, neither do they in the Stevens.

We have thus far gone on the theory that the patent covers equivalents to the fullest extent, and have shown that even on that theory there is no infringement. But according to *McCormick v. Talcott*, 20 How. 404, they are not thus entitled to equivalents. The Tanner brake is admitted in the oath and patent to be an improvement on the old brake. The patentees, however, may perhaps claim that it was the first of its kind—that is, the first double acting brake, and therefore entitled to equivalents.

Supposing it to be the first of its kind, in what did the invention consist? The first railroad brake broke on only two wheels; the next step was to combine two of these brakes, so as to brake on four wheels, thus making what is now known as the old single brake, though really a double brake. Then two of these brakes were again combined, making the present double, or more correctly speaking, quadruple brake. This second improvement, therefore, was of the same sort as the first; it was only a second duplication.

But the Tanner was not the first double-acting brake. We leave out the *Nicholls*, *Millholland*, *Stanley-Talson* and *Camden & Amboy* brakes, and confine ourselves to those inventions the priority of which is admitted.

1. The *Griggs* brake, patented December 31, 1839, is disclaimed in the Tanner patent, and so are all other brakes which are operated by the movement of the cars. The *Griggs* broke on all eight wheels by mechanism connected with one of the axles, controlled by a clutch moved by the brakeman. We do not claim that either this or any of the "bumper" brakes was the same as the Tanner; but they were double brakes, and far better than the "bumper" brake described in Batchelder & Thompson's original application.

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2. The *Springfield* brake was first put upon two crate cars on the Western Road in 1843, and continued in use two summers, or as long as those crate cars were used. p. 145. It was again put on that road in 1856, as shown in Springfield brake No. 3, and used on all the cars, 23, in the mail train between New York and Boston, 16 months. p. 144.

In 1871, a car with the *Springfield* brake No. 2, and a car of the same build with the *Tanner* brake, were run in the same train for several months; this brake was then put on five cars, all in the train, and it was run for several months between New York and Albany, in alternation with a similar train with the *Hodge* brake. About the same time, similar experiments were tried on the Bos. & Prov., Bos. & Low., Conn. River, Prov. & Wor., and other roads, with Springfield brakes on the whole train, or with part Springfield, and part Tanner or Hodge.

A vast deal of testimony was taken on this point, which we should be glad to analyze at length, but we have not the space, nor can we think it necessary. We can only indicate its general nature. First, the two cars running in the same train, one with the *Springfield*, and one with the *Tanner* brake, wore out the iron brake shoes just alike, thus showing an equal friction on the wheels. Second, defendants' witnesses, p. 965–1174, brakemen, engineers, conductors, car-builders, and experts, over 50 in all, swear that the *Springfield* brake was as good or better than the *Tanner;* it stopped the train as quick; they whistled for down brakes at the same distances; they *never knew, without being told, whether they had on the one brake or the other.* Much of this evidence is very full and convincing. The patentee's witnesses swore, as usual, just the other way. The *Springfield* brake was not so good as the *Tanner;* it did not stop as quick, it was always getting out of order.

Now we admit that the *Springfield* brake is not the same as the *Tanner*, and does not defeat the *Tanner;* we admit that on very short curves, such as are sometimes found near depots and in cities, it does not work perfectly and is liable to be strained. But such curves are found on very few roads; as Adams states, not on the main line of any road. p. 984.

The same defect, though to a far greater extent, existed in the first sewing machine. It had its work stuck on pins, and hence could only sew on a fixed line. It was not so good on a curve as the Springfield brake. And yet it was never held an abandoned experiment, though it was an abandoned machine.

On the other hand, except on these very sharp curves, the *Springfield* brake is as good, and, as the evidence we think shows, even better than the *Tanner*. On a sharp curve it may not work so well; but neither does the *Stevens*. The patentees have shown that the *Stevens* on a curve is as bad as bad could be. "It stalls the horses, so that we have to disconnect the rods to get them through the city sometimes. And then the men get mad and tear the rods off, and the cars come through all the rest of the way without any brakes. This happens often and gives a great deal of trouble." p. 864, 869.

Nothing worse than this is anywhere said of the *Springfield* brake. The fact is that the trouble in both these cases was mainly owing to the very sharp curve which the cars had to pass in a city. That curve was so sharp that neither the *Stevens* nor *Springfield* brake could get round it without being strained, but this does not prove the latter brake to be worthless any more than the former. What it does prove is that the same advantage which the *Tanner* has over the *Springfield* brake on a curve, it also has over the *Stevens*. And in both cases this advantage is due to the same thing, viz., the centre lever, as is made plain by Waters. p. 710. Yet the *Stevens*, they say. is an infringement none the less.

Again, the *Springfield* brake, with all its defects, wore out just as many pounds of iron brake shoes as the *Tanner*. But this it could not do without producing the same friction on the wheels; and the same friction on the wheels must produce the same stops. p. 968 *et seq.*

3. But there is another Springfield brake about which there is no dispute. This is the *tender brake*, which has been in use on the Boston & Albany Road ever since 1841. p. 142–5. True, it can be operated only from one end, and in that respect is inferior to the *Tanner;* but it is none the less a double brake, and after a continued use of over thirty years may safely be called successful.

We submit therefore that the Tanner combination can claim equivalents to no greater extent than the *divider* combination in *McCormick v. Talcott;* but giving it the full benefit of equivalents the Stevens brake is still as far from being an infringement as ever.

IV.

THE DAMAGES.

We believe no case has ever come before this court in which the damages were so enormous as in this. By the master's report and the first final decree based upon it a total value was in effect put upon this patent of at least

SIXTY MILLIONS OF DOLLARS.

The way in which we get at this result is this: The master found the saving to be over $450 a car, per year. But according to the best authorities there was an average of 10,000 cars in the United States during the 20 years ending July 6, 1873. If then they all had had on the double brake, and had to pay at the rate fixed in this decree, the sum total would reach $90,000,000. It is true they did not all use the double brake during the whole period, but by far the greater part of them did. And if we include the freight cars on which the double brake is used, and which at least equal the number of passenger, baggage and express cars—there being no less than 3,000 of them on one road alone—

and the horse cars, we shall probably exceed the above calculation rather than fall below it.

After this final decree defendant asked leave to file a bill of review on the ground of newly discovered evidence, and at the same time urged upon the court some of the objections here made to the master's report. The motion was overruled, and with it all our objections; but the court struck off from its decree about $16,000, thus reducing the final amount to $47,725, at which the total value of the patent would be some forty or fifty millions, and the amount for which this defendant would be ultimately liable about $1,200,000. And there is a bill now pending against this defendant on the extension of this patent alone, in which the plaintiffs claim $800,000.00.

Now before coming to our specific objections we beg the Court to consider whether on this general statement alone this decree ought not to be set aside? Is this Court ready to affirm judicially that any patent is or can be worth fifty millions of dollars, or forty millions, or even twenty? Or will the Court establish such a precedent for the hundreds of other cases which if this is successful, are still to be tried?

If this were a thousand million, instead of fifty no one would think of arguing the matter. But it is hardly less certain with fifty millions than with a thousand. Or, if complainant had been able to include all the railroads of the country in a single suit, and had thus come here with a decree in his favor of fifty millions, then too no argument could have been required. Such a decree as that would have fallen by its own weight.

Again, if the roads have saved fifty millions by the *Tanner* brake they have saved at least ten millions more by the *Hodge* and *Stevens*, the value of the latter having been already fixed at $50 a car per year; they would save in the same time another fifty millions by the Westinghouse, and at least five millions by the Swage Block. Thus, according to the theory in this case the roads would save in 20 years from one to two hundred millions by these inventions alone. But a railroad is little more than a bundle of inventions, and every one of them can be shown by any necessary amount of evidence to save any necessary amount of money. If then we add to the above the patents on locomotives and all their various parts; boilers, flues, smoke stacks, grates, valves, cut-offs, and their innumerable connections—the passenger and sleeping cars—the wheels, axles, journals, boxes, couplings, platforms, springs, trucks, rails, switches, frogs, bridges, and so on, ad infinitum, and calculate the savings on each, we shall begin to understand what has so long been a puzzle to many, how the railroads in this country have all contrived to get so rich during the past twenty years!

But we all know that the railroads have not saved any such money. We all know that these calculations of the saving effected by new inventions are in the highest degree delusive. Hardly a week passes when we are not greeted with the news that somebody has invented a new improvement in the steam engine, for instance, by which you can save one-third or one quarter of the coal. We are incredulous—we ask for proof. We demand the figures, and the figures come at our call. They are all that could be wanted. Nay more, the machine is set to work before our eyes, the coal weighed to an ounce, the power estimated to a hair, and we see for ourselves that the saving claimed is effected. Another distinct improvement is shown, in the same way, and with equal certainty to save another quarter of the fuel. Do they both together save half? Do they both save a quarter? We all know they do not. We have all learned to make a large deduction from all such estimates. And yet it is these very estimates and far more than these that are too often imposed upon the courts as the sober truth.

In estimating these so called savings in this case, the master compared the *Tanner* with the *old single* brake, rejecting both forms of the *Springfield* brake, that is, the form used on the *crate cars* of the Western road in 1843 and '4, and the form used on the *tenders* of the same road from 1841 down to the present time, as adandoned and unsuccessful experiments. He found that for five years defendants ran constantly in passenger trains 24 cars, and required therefor 12 brakemen and four baggage men, equalling 16 brakemen; and that the use of the patent saved an equal number, that is 16. p. 37.

That on mixed trains they ran two cars, requiring one baggage man, equal to *one* brakeman, and saved *two* brakemen. On freight trains they ran two caboose cars, requiring two brakemen or conductors, and thus saved two brakemen. Making in all 20 brakemen saved. He called the wages of a brakeman $34.40 per month, making a total saving from this source of $41,280. That is he assumed that defendants could break the same number of wheels in the same time with the double brake that they could with twice as many men with the single brake.

In addition to this he found that the patent saved 2 sets of wheels per car per year; and that, after deducting the value of the old wheels, this left a saving of $22,358.40, which added to the saving by brakeman gave a total of $63,638.40, the amount of the first decree, or a little over $450 per car per year; equal, as we have just seen, to $60,000,000.00, for the whole patent, on the most moderate calculation. It is true that the court has reduced this finding some $16,000, but at the same time expressly overruled all our exceptions, thus unqualifiedly approving of the method adopted by the master. These errors then all remain, in kind, if not in degree; and still work very great injustice to the appellant. These errors began early.

I. The interlocutory decree of July 18, 1871, directs the master to compute, not only the defendant's profits, but, in addition thereto, the complainant's damages. p. 35. The decree was so drawn, probably under the impression that the case was governed by the law of 1870, Section 55. But that law has no application. The repealing clause and schedule, Section 111, expressly limit the *remedial* provisions of this act to suits thereafter to be commenced. It may be said, however, that defendants are not prejudiced, because the master has found the damages in this instance to be the same thing as the profits.

To this we reply, first, that the decree is not simply an erroneous finding as to the *facts*, but it entirely mistakes and misapplies the *law*. But, secondly, it is impossible to say that defendants have not been damnified. There were many nice questions for the master to settle; and we cannot tell how far his doubts may have been resolved in favor of complainant by the thought that he was entitled to something more than mere profits. The master should not be subjected to such a bias, nor the defendant to such a risk. And in such a case it must be shown beyond doubt that the error neither did nor could have worked the party any prejudice. *Deery v. Cray*, 5 Wall. 795.

II. The master erred in finding the Springfield brake an unsuccessful and abandoned experiment, and on that ground excluding it from his calculations. We have already argued this question at p. 78 of this brief, and only repeat here that a brake which has been used constantly for the last thirty years can in no sense be deemed an experiment, still less unsuccessful or abandoned. Nor can those terms with any more propriety be applied to the other Springfield brake which was used on the *crate cars* for part of two years, and as long as those cars themselves continued to be so used. Nor can a brake be called unsuccessful which is admitted to do good work on a straight track, or on a short car, simply because it did not work so well as some others on a curved track or on a long car.

III. But, admitting that the master was right in adopting the single brake as his standard, we still say that his method was erroneous, not only as to the facts but also as to the law.

The savings here were found to be of two kinds, the saving of brakemen, and the saving of wheels. We will consider first,

THE SAVING OF BRAKEMEN.

The master has found that defendants saved as many brakemen as they employed, on the assumption that they must have had twice as many men with the single as they actually had with the double brake. Only on the mixed train he has, for some unknown reason, found that they saved *twice as many* as they employed. And he has found that they have thus saved the wages of all these men; and that they are chargeable with the full amount of these wages as profits. We expect to show that this finding and the assumption on which it was based are both alike fallacious—that defendants never have saved a single man by the use of the double brake—that still less have they saved as many as they employed—that consequently they have not saved the wages of these men—and finally, even if they had saved all these wages, that those wages would not in any proper sense represent defendant's profits.

And first, we deny that defendants have ever saved a single brakeman by use of the double brake. On the contrary, it has been, like the Westinghouse brake, the Miller platform and coupler, and many other similar inventions, simply an added expense. It is not pretended that the defendants in this case actually did employ twice as many brakemen with the single brake as they did with the double. The evidence is conclusive that they continued to use precisely the same number. The only evidence on this point as to defendant's road is that of Garvin. p. 962, and he swears that he had been in the employ of the Concord & Nashua, the Northern New Hampshire, the Vermont Central, and *the Chicago & Northwestern; and that on all these roads they used just as many brakemen with the double as with the single brake.*

What other roads did is not important, but the evidence shows that the same was true in regard to them. See dep'ns of Hayes, p. 960; Burton, p. 906; Hutton, p. 910; Van Syckle, p. 510; Elder, p. 921.

Now if defendants had in fact diminished the number of their brakemen in consequence of the double brake, then we admit they might have been chargeable with *a part* of that saving; but as they never did diminish the number, we say that there could not possibly have been any saving in that direction, and whatever saving there may have been must be sought for somewhere else. What then is the saving by the use of the double brake? Simply this: the saving of time. That is, using the same number of brakemen as before, the cars can be stopped a little sooner. That this advantage has been vastly overrated we think there is no doubt. It has been quietly taken for granted that a train could be stopped with the double brake in half the time required for the single. But a moment's thought will show that this, like a thousand other merely theoretical notions, is entirely a mistake. There are many other forces at work to bring a train of cars to rest besides the brakes. The inequalities in the track, both lateral and vertical; the curves, the joints between the rails, the friction on all the axles, even the resistance of the atmosphere, all combine to bring about this result—and every one of these forces is of course just as active with the single brake as with the double.

Owing to these and perhaps other causes that have not yet been explained, it is far from being true that a train can be stopped twice as quick with the double as with the single brake. On the contrary, the experiments tried for this purpose show that there is really very little difference between them. These experiments were made in November, 1871, and proved that a train can be stopped by the single brake very nearly as quick as with the Tanner. See dep'ns of Hitchcock, p. 1075-6; Adams, p. 982, and Stearns, p. 1086-7.

But admit that the double brake will stop the train nearly twice as quick as the single, that does not prove any saving in brakemen. It is still a saving in time only, and it is for that time if anything, that defendant ought to pay. A simple illustration will make this perfectly plain. Suppose a patent for an improvement in wagons by which one horse can draw as much as two without it. A, the infringer, still drives his two horses, and he carries no heavier load. Has he saved one horse, or must he pay the same as if he had? It is clear that thus far he has saved nothing except that it is easier for his horses. But now suppose he drives a little faster—as the improvement would enable him to do—and thus saves a little time; here we have a clear saving from the use of the invention, a saving that he ought fairly to pay for, that is if it should prove capable of estimation. But nothing can be clearer than that he has not saved either of his horses. To put it in a different shape, if he does not use the improvement at all of course he cannot be made to pay for it. And if he does use it, but uses it in such a way as not to gain the advantage promised, that is, a saving in horses, but so as to gain a different advantage, that is a saving in time, it seems equally clear that whatever profits he is liable for in a court of equity cannot be based on any speculative saving of horses which he has not saved, but must be awarded, if awarded at all, for the sole benefit he has derived from the invention, viz., the saving of time.

The appellee's argument here is that defendants found it *necessary* for the safe running of their trains to have brakemen enough to apply the brakes to a certain number of wheels; that this would have been equally necessary with the single brake, and hence they *must* have had twice as many men.

There are several answers to this, every one of which seems to us conclusive. First, whether necessary or not, no railroad ever did in fact do any such thing. No railroad ever did employ twice as many men with the single as with the double brake, and of course no road ever found it necessary to do so. This so called necessity therefore is a coinage of the patentee's own brain.

Second. Whether a thing is necessary or not depends often, if not always, on what it costs. A prudent railroad manager might well consider a device a necessity provided its advantages outweighed the increased expense. Thus it is a necessity to have a guard rail in the centre of the track on bridges, but it is not a necessity to have it on the whole road, though it would be very desirable to do so, for the simple reason that no road can possibly afford it. But if in some way the cost of such a rail could be largely reduced, then it might become a necessity over the whole line of the road. So with the brakes; it may be thought by some one railroad official a necessity to apply the brakes to at least half the wheels in a train, provided it can be done at not too great a cost; but if he has got to pay at the rate of three hundred dollars a car a year for the increased braking, he would at once say, "We cannot afford it."

Again, the court is familiar with the bit known as the "curb" by which one man can with ease curb the most fractious horse. In fact it is much easier for one man to check a horse with this bit than for two with the old bit. Then, according to appellee's argument, the use of the curb would save the wages of at least one man, because in order to do with the old bit what one man can do with the curb, would require two men. And if the user of the curb should admit that he found it necessary to use it, that he should not consider it safe to do without it, it would follow that if he had continued to use the old bit, he must and would have employed two men to hold his horse. This argument of "*necessity*" is just as good in this case as in the case of the brakes.

Third. This speculation as to what defendants might and might not have done is all idle. As this court has so often decided, the defendant is never liable for any mere speculative profits, but only for his actual profits. He is not liable for what he might have made, nor even for what he ought to have made, but solely for what he did make. Appellee has here been driven to use a very singular illustration. He said in the court below,

> "As well might it be said that the modern weaver's loom—for instance the hair cloth loom—saves no labor, though at least one hundred looms can now be tended by the same number of girls which were formerly required to tend fifty. Apply the counsel's argument to this, and it would be that the mill owner who increases his looms from fifty to one hundred saved no attendants, because he still employed as many as when he had only fifty looms. But with the same labor he has doubled his product; doubling the product with the same labor is equivalent to the same product with half the labor. This is the case with defendants. Assume they do still employ the same force of brakemen—they have more than doubled the wheels "braked" by that "force."

That this argument is fallacious, that it has no application to the present case, will become apparent at a glance. The mill owner who doubles his looms of course doubles his products; he can make two yards of cloth where before he made only one. And if he sells his cloth at the same price he of course increases his profits by a sum equal to the diminished cost of production. But the railroad receives no such products from its brakes, it has nothing more to sell; no more money comes into its coffers. If the railroad received a certain sum of money, say five dollars, for every additional wheel, then we admit the cases would be parallel. To put this in another way. The mill owner has fifty girls, and the railroad has fifty brakemen. Then certain improvements are made by which the girls and the brakemen can both do twice as much work as they could before. But neither the mill owner nor the railroad makes any change in the number of their servants. Then what happens? At the end of the year the millowner has sold twice the quantity of cloth without paying out any more wages than before. The railroad has paid out no more wages and it has paid out no less. But it has no more cloth, and no more of anything than it would have had with the old brake, and of course it has made no profits. It has simply incurred the increased expense of the new brake. It has absolutely nothing to show for it; nothing that could be set down on the credit side of its brake account, according to any system of book-keeping we ever heard of.

The appellee says further that defendants never used the single brake, and he argues this at length as if it were a matter of importance. It is but a small part of defendants' road included in this suit, and what they used on the other parts we only know from the testimony of Garvin, already quoted. That shows that they used the same number of men with the double as with the single brake.

But admit the appellee to be correct in his assertion, that only makes the matter worse; for if defendant never used the single brake, how is he to tell how many brakemen they would have used with it. It is clear that in that case the whole thing would have to be left to conjecture and speculation, even more than it is now.

To re-state then our proposition in more general terms, we insist that unless the user of a patented device has actually made money by it, he is not liable for any profits. We do not mean by this of course that he must have *received* more money; it is the same if he has *saved* it. But the saving must be real, not fanciful. And it will not do to argue that *if* he had used the old machine in a different way, in a way that no one ever did use it, in a way that no one ever would use it, he would have saved so much money. The plaintiff is here suing in equity, he has elected to claim defendants' profits, and he must take whatever profits were actually made.

But secondly, admitting that defendants did save any brakemen by the double brake, we deny that they saved as many as they employed with the double. The master has found that defendants employed 16 men on 24 cars, and that they therefore saved 16. If then they had happened to employ only 10 men they would have saved only 10; and so, if they had employed 24 men they would have saved 24. We thus reach this strange conclusion, that the more men to a car a road has employed with this double brake, the more it has saved. That is, the more one spends the more he has. If anything more were needed to show the utter unreasonableness of this whole theory of profits, its purely visionary character, we have it here. For there is evidently no other way by which to estimate this supposed saving of brakemen than just this. If defendant did in fact save any men, they saved a number equal to that which they employed with the double brake. But that they could not possibly have saved that number; that such a method of estimating the number leads at once to the grossest absurdity, is fully demonstrated by the above illustration.

Again, the master has found that defendants employed 12 brakemen and 4 baggagemen, on 24 cars, with the double brake; and that they would have had twice as many with the single. That is they would have had 24 brakemen and 8 *baggagemen*. But there would have been no more baggage with one brake than with the other, and of course no need of any more baggagemen. The four extra men, therefore, having nothing to do with the baggage, would have been more than the equivalent of the four whose first and principal duty it was to look after the baggage. It is absurd therefore to suppose that any road would have doubled its baggagemen simply to gain their services as brakemen. And this leads us to suggest what may perhaps be a partial explanation of the error into which the master has fallen. He has assumed that the brakemen did nothing but brake, whereas this was a small part of their duties. They were required to take care of the fire and lights, to call out the names of the stopping places, to assist passengers on and off the cars; and generally to help in running the train.

The court below asked: "Suppose a brake by which the engineer could brake all the wheels at one and the same moment, would not that save all the brakemen?" And the answer is, we have just such a brake already, the "Westinghouse," by which the brakes of a train are more completely under the control of the engineer than the brakes of a single car are under the control of the brakeman. By a turn of his hand he can apply all the brakes in an instant. He can graduate the pressure with greater nicety than any hand brake in existence. He can stop the train with a suddenness never before known. And what was not anticipated, even by the inventor, the pressure is applied first, just where it ought to be, to the rear car of the train, and then to every other car, in order; thus preventing their running on each others heels. In short, it is the very perfection of a brake; and, if any brake ever *could* save all the brakemen, this ought to do it. According to the *theory* adopted in this case, it *would* save all the brakemen. But we all know it does no such thing. We have all ridden, time and again, on trains furnished with this brake, but we have never ridden without brakemen; and we probably never shall. Waters' Dep, p. 705.

According, then, to the theory in this case, the users of the Westinghouse would have to pay for as many more men as would be necessary to do with the hand brake what is done by the Westinghouse; that is, not merely double the number, but four, six, ten times the number, according to the size of the train; because, with this brake, one man can do the same work for ten cars that ten men can do with the hand brake, and do it much better, too; thus fixing the savings by the Westinghouse brake as at least seventy millions more, while all the time the fact is that railroads employ, as a general rule, the same number of brakemen with the Westinghouse as they did without it.

An illustration or two will make these points still plainer. Some years ago, a man invented a device by which it was said the sails of a ship could be handled by one-third the number of men required before. Then, according to this case, the users of that device would save two-thirds of their sailors, and of course would be chargeable with their wages. Or to take the curious modification of this rule adopted in this case, if they continued to use the same number of sailors after introducing the device that they did before, they would have to pay for twice that number, as for so many men saved by this wonderful invention. That is, if the crew at first consisted of twenty men, and if after adopting the device they still employed twenty, they would have to pay the patentee the wages of forty men. Why? Because—as found in this case—sixty men without the new invention would be only equal to twenty with it!

Again. A, we will suppose, has three servants a part of whose duties is to carry up coals for the fires. By using an elevator one man can carry up as much as two without it. A, however still keeps his three servants, but on being sued for infringement on the elevator it is found by the master that he has saved the wages of an equal number, because one man with the elevator is equal to two without it! We can think of nothing quite equal to this legerdemain except the Irishman's stoves of which we have all heard, one of which saved half of the fuel, while two saved the whole.

It seems to us that enough has now been said to show that this alleged saving of brakemen has no existence in fact, that it is not merely speculative, but visionary, that to assume otherwise is to assume not only what is not supported by the proof, but what is directly contrary to the proof. It has betrayed the master and the judge into awarding an amount of profits that dwarfs all preceding awards into insignificance; an amount so startling and overwhelming that one would naturally suppose they would have sought some means to diminish it; that they would have sought diligently until they found it. On the contrary, not satisfied with this enormous profit based on the fictitious saving of brakemen, they then went on to add half as much more for what was curiously enough claimed to be

The Saving in Wheels.

The master's report on this part of the case was as follows: Defendants used what was equal to 29 cars for one year, and 27 cars for each of the other four years. The patent saved two sets of wheels per car per year, making 274 sets in the five years.

The cost of a set of wheels was	$ 133	60
Cost of putting on a set	8	00
Total cost of a set	$141	60
Or for the whole 274 sets	$ 38,798	40
Value of old wheels for old iron	16,440	00
Leaving as actual saving	$22,358	40

This was on the theory that the double brake did not slide the wheels so much as the single, so as to wear flat spots upon them. Applying to this result a similar calculation to that made as to the brakemen, we find that the railroads have saved by the use of the double brake, during the 20 years covered by the patent, some twenty million dollars worth of wheels, or an amount so vast as to be not merely improbable but wholly impossible, and such as at once to make out a *prima facie* case against the patentee. The evidence to overcome this presumption, and by which this prodigious saving is made out, is of the most unsatisfactory sort. We find no fault with the witnesses; but simply with their means of knowledge, and the imperfect character of their statements. Most of this testimony is what may fairly be called guesswork. The witnesses have an idea, a notion, that the wheels were not changed so often after they got double brakes as they were before. And they *think* that they saved one, two or three sets of wheels a year. One witness gives his impression, and the next thinks that is about right. Again, none of these tell us anything of the conditions under which this comparison was made. We have no means of knowing how much of this apparent saving was due to a difference in the quality of the wheels, whether good iron or bad, with chilled tires or without, of iron or steel, or in the weight of the cars, or in the condition of the track, or the increased care or efficiency of the men. We know that the tracks generally became smoother, and that the brakemen gradually acquired greater skill and experience; and that they found out that sliding the wheels not only injured them, but would not stop the train as well as when they were not sliding. The substitution of iron for wooden shoes may also have had something to do with it, as the wood would take hold of the wheel, and thus prevent its turning, more than the iron.

It is very certain that there is no more need of sliding the wheels with the single brake than with the *Tanner*. The increased leverage in the Tanner, in fact, enables the brakeman to put more force on each wheel than can be done with the single brake. See Dep. of E. S. Renwick, one of patentee's experts, p. 942, Int. 18, and p. 944, Int. 6. It is equally certain that by properly graduating the leverage in the single brake, the danger of sliding the wheels could be so far diminished as to go for nothing. And even without that, a little more care on the part of the brakemen is all that would be necessary to remedy this supposed evil. There is not the slightest justice therefore in crediting this vast saving to the double brake.

But, in the second place, it is not so important what was done on these other roads as what was done on defendants' road. A single set of wheels did not last a year on defendants' road with the *Stevens* brake. On the contrary it is stipulated that they changed their wheels as often as once or twice a year, sometimes oftener. p. 850. And *Gunther*, patentee's witness, swears that they changed them "every four months, about, on an average." p. 860. That is, instead of one set of wheels lasting a year with the double brake, the defendants actually had to change them three times a year. Yet the master has charged defendants with two sets of wheels saved a year, on the theory that one set would last a year with the double brake.

The next error, however, is still more glaring. In this comparison between the wearing of wheels with the single and double brakes the same number of brakemen was employed with each. Not one of the witnesses testifies to observation or experiment, where the number of brakemen employed with the single brake was double that employed with the double brake. They could not swear to that, for the simple reason that, as we have already seen, no road ever did in fact employ twice the number of men. If then we admit that with *two* men to a train of six cars the wheels would slide so much more with the single brake than with the double, it by no means follows that this would be the case if the single brake had *four* men to the train. It may be that with only two men their natural hurry and impatience, and their inability to put the brakes on more than half the number of wheels, would lead them to overdo the matter, and apply more than the needful pressure on the wheels they did brake. But if there had been four men, knowing that they could brake twice the number of wheels, knowing that they had plenty of time, there would be no need of any of this hurry or impatience. They would be very nearly the same as two men with the double brake. And certainly there is no reason or justice in assuming that four men with the single brake would slide the wheels just as much as two men. Yet this is what was done by the court below. The court first charged defendants $40,000, for brakemen, on the theory that they must have employed *twice* the number with the single brake; and then charged them $20,000 more, for wheels, on the theory that they would have employed only the *same* number. Defendants are thus made to pay twice over for the same thing. To the first amount already so enormous, the court has added half as much more, and without any evidence to justify it.

Appellee will reply to this that the number of brakemen makes no difference, that sliding the wheels is a vice inherent in the single brake; and that a man putting all his strength upon only four wheels is more likely to slide them than if that strength were divided among eight. But according to appellee's own testimony, just quoted, the same man can apply more force to each one of the eight wheels with the *Tanner* brake than he can to each of the four wheels with the single brake. If then he applies all his strength he will be more likely to slide the wheels with the *Tanner* brake than with the single. If in fact he does not so often slide the wheels, it is because with the double brake he has more control over the train, and so does not need to slide them, or to run the risk of sliding them. Braking, as he does, on all eight wheels, he does not need to overdo the matter, or to impose more than their fair share of duty on any four. So if there were a man at each end of the car with the single brake, they would in like manner control the train, and would not need or feel tempted, as a single man might do, to apply so much force as to run the risk of sliding.

The burden of proof is here upon the plaintiff. He must prove beyond a reasonable doubt that with a man at each end of the car the single brake would still slide the wheels just as badly as with a man only at one end. Mere theorizing here will not do. The defendants insist that two brakemen with the single brake are the same as one with the double; that having paid for this extra man he belongs to them, and that they ought not to be made to pay for him over again under another name.

Renwick, the plaintiff's expert, when asked to what the alleged difference as to this sliding of wheels was due, replied: "In my opinion it is due to two causes, viz.: first, that where the single brake has been used *there have not been a sufficient number of brake shoes put in operation to stop the train in the time permitted for the purpose;* and second, that when the single brake was used, a brakeman could only operate simultaneously upon half the number of shoes that he can when double brakes are used." p. 946.

Of course, then, if twice as many brakemen were employed, this first reason could no longer exist. But he says further: "So far as the mere stopping of the train is concerned, I do not know that there would be any great difference between the effect with the single brake and the double brake—assuming that brakemen enough were used with the single brake to put the same number of brake shoes in operation as were put in operation when the double brakes were used."

And yet, in the face of this admission. the court below has found that even with this increased number of brakemen the wheels would slide as badly as ever. We admit, of course, that the wheels would sometimes slide with the single brake, even with a man at each end of the car, but so they do with the double brake. The question, however, is not whether they would sometimes slide, nor even whether they would often slide, but whether they would slide as often with the two men as with one. The evidence on this point is all theoretical, none of the witnesses testifying from actual experience; but when the plaintiffs' expert gives it as his opinion that this difference in sliding is in part at least due to the fact that a sufficient number of brake shoes have not been put in operation, we cannot see how the court below was justified in assuming that his opinion was erroneous. The doubt here, if any, is to be determined in favor of the claimants. It is the plaintiffs duty to furnish the court with the "proper data for a calculation of his damage, and not expect the court to work out the result for him, by inferences or presumptions founded on such subtle theories." *New York v. Ransom*, 23 How. 491.

We say, then, as to this supposed saving of wheels, that it is largely fanciful and fictitious, even when comparing the double brake with the single brake, *with the same number of men*. But we say further that it is not fair to make the comparison in that way, but that the court having calculated the saving of brakemen on the theory that we *must have used twice the number of men*, we are entitled to the full benefit of that increased number when we come to estimate this supposed saving of wheels.

Finally, let us suppose that a certain saving, either in wheels or brakemen or both, has resulted from the use of the *Stevens* brake, we still deny that this saving at all represents the profits of defendants. Thus a volume of law reports can be printed for two dollars. But to do the same work by hand, and not nearly so well, would cost a hundred. Is the user of the press therefore going to pay the patentee ninety-eight dollars for every volume sold, when he himself only receives five? Or to put it in another way, one man can do with the press as much as a hundred without it. Has the user of a press therefore saved the wages of the ninety-nine? According to the rule of this case he has, and is bound to pay that much to the patentee. That is, he is bound to pay as profits a sum vastly in excess of the gross receipts of his business. Again, the carved legs of a common chair or table can be turned in a lathe at the cost of a few cents, while to do the same work by hand would cost a dollar. But it would be strange law, to say nothing of equity, that should award to the patentee of the lathe the 95 cents thus saved on each table leg, when all the defendant had received was five cents. So with Whitney's cotton gin. The value of the labor saved by that invention exceeded the total value of the cotton, but the user of the gin could not be charged wheels they did brake. But if there had been four men, knowing that they could brake twice the number of wheels, knowing that they had plenty of time, there would be no need of any of this hurry or impatience. They would be very nearly the same as two men with the double brake. And certainly there is no reason or justice in assuming that four men with the single brake would slide the wheels just as much as two men. Yet this is what was done by the court below. The court first charged defendants $40,000, for brakemen, on the theory that they must have employed *twice* the number with the single brake; and then charged them $20,000 more, for wheels, on the theory that they would have employed only the *same* number. Defendants are thus made to pay twice over for the same thing. To the first amount already so enormous, the court has added half as much more, and without any evidence to justify it.

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Of the correctness of the above principle there can be no doubt, and there is no reason why it should not be applied in all cases at least where the length of use and the magnitude of the estimated profits demand it—as they clearly do in the present case. It may be thought, however, that this principle has here no application because the defendant is a railroad. and does not sell its brakes or the products of them. But it applies to a railroad just as much as to any other defendant, and even more; for there is no other class of business where competition is so keen, or where prices are so constantly kept down, both by this competition and by the public demand. The only difficulty attending this part of the case is in showing that this particular invention comes within the principle now under discussion. From the very nature of the case it is not easy to show that the railroads have reduced their rates in consequence of the saving effected by the double brake. Yet that they have made such reduction is we think capable of being shown, especially if the saving from this brake makes any approach to the amount above suggested. Thus it costs only a dollar to carry a barrel of flour from Chicago to New York by rail, while it would cost at least twenty dollars by wagon. Suppose then that one could have a patent on the whole railroad, could he recover of an infringer nineteen dollars as the saving on every barrel transported? Clearly not, for the infringer has only been paid a dollar, and of course cannot have saved the nineteen. But what is true of the railroad as a whole is true of its parts. The whole railroad is but an aggregate of inventions. The greater part of them are money saving inventions, some doing more in this way and some less; and it is solely owing to this fact that the railroad is able to carry so much cheaper than the wagon. But the savings effected by all these inventions evidently are not retained by the railroad; for, to do that, the railroad would have to charge just as much as the wagon. But if it did charge as much as the wagon for carrying freight, it would have very little freight to carry, and would thus require fewer cars and fewer brakes.

That is to say, in every one of these cases, the printed book, the legs of the table, the cotton gin, and the railroad, it is impossible for the user of the invention to obtain a profit which shall make any approach to the nominal saving. If indeed he could still sell the products of the invention at the old price, if he could sell his printed book at the same price as the manuscript, if he could sell his table legs turned in a lathe at the same price as when made by hand, if the railroad could charge the same price for transportation as was formerly charged by the wagoner, then we admit that the difference in the cost of production would fairly represent the savings. But we all know this to be impossible. We all know that it is only on account of their greatly diminished price that these articles can be sold in such greatly increased quantities.

AND IT IS EVIDENTLY UNFAIR TO GIVE TO THE PATENTEE THE SAME PROFIT ON THESE WHOLESALE SALES AT THE DIMINISHED PRICE THAT HE WOULD BE ENTITLED TO ON THE VERY SMALL NUMBER OF SALES THAT COULD BE MADE AT THE ORIGINAL PRICE.

Thus in the Mowry wheel case, if by the use of that process the infringer saved one dollar a wheel, and sold a hundred thousand wheels *at the old price*, he might justly be charged with a hundred thousand dollars; but if in order to sell that number he had to lower his price half a dollar a wheel, it is evident that his actual profits have been just so much diminished, and that fifty thousand dollars would be all he ought to pay. In that case the patentee gains whatever advantage may be due to the increased number of wheels sold, and of course ought not to claim the profit *on each wheel* that could only have been obtained, if obtained at all, by the sale of a smaller number at the higher price.

We insist then with full confidence that even if the railroads have in one sense saved $350 a car a year by the double brake, they cannot justly be charged that for every car, because in order to do their increased business they have had to charge reduced rates, and because the patentee receives his full equivalent for his loss of profits on any one car from the great increase in the number of cars which the lower rates alone render necessary or even possible. To this the plaintiff replied as follows:

"In conclusion upon this point it may be said in answer to the argument that a railroad is compelled constantly to reduce its rates and thus to share with the public the benefit of every invention, that the presumption of common sense is that if it does reduce its rates it will thereby obtain more business and make more money. In any trade the subject of which is in constant demand—as railroad transportation is—reduction of price irresistably produces increase of traffic. Therefore, though there may be less profit on each individual transaction, the greater volume of transactions makes the aggregate profit much larger. A glance at the report of almost any sound legitimate railroad enterprise will show that this is especially true of that class of business. The road may charge each passenger less fare, but it transports so many more passengers in consequence that its receipts are enormously increased. The latest report of the Chicago and Northwestern R. W. Co. strikingly illustrates this. It states that during the last fiscal year it carried 2,479,202 passengers, against 2,224,705 the preceding year—being an increase of $11\frac{44}{100}$ per cent., while the receipts per passenger were decreased only 3 [illegible]/100 per cent. It is therefore easy to understand that its aggregate passenger earnings were $3,509,702, as against $3,260,654 for the previous year, as stated in the same report—an increase of nearly a quarter of a million in this one item in a single year. The defendants admit that they are enabled to make these reductions because they use these labor saving inventions, and the figures quoted show that the reductions increase their profits enormously. They have therefore not surrendered the profits realized from the invention. They have simply converted them into a different form, and as they have had them they should account for them."

This reply is plausible, but unsound. We say nothing of the strange assumption that the increase in traffic on this road during the year mentioned was due to the reduction in rates, though it is plain that it might have been due to a hundred other causes. The real weakness in this line of argument lies much deeper. The patentee fails to distinguish between retail and wholesale. He insists on being paid the retailer's profit on the wholesale trade. He admits that defendants' profits on each individual transaction are less in consequence of this reduction in rates, but insists that his own profits on each indvidual transaction shall still be the same as ever. He fails to see that this is a rule that ought to work both ways. If he had been the patentee of the Mowry wheel he would have claimed his dollar a wheel, even though the defendant had been compelled to sell them at a profit of only fifty cents a wheel. If the patentee of the pin machine he would have claimed the full saving on every pin, though in order to make that profit the defendant had had to sell a thousand. If the patentee of the whole railroad, instead of this small part of it, he would have claimed his nineteen dollars a barrel, though in order to make that nineteen dollars the defendant had had to carry two hundred barrels. He would claim on each individual transaction the profit which defendant had been able to make only on a hundred or a thousand.

The absurdity of such a claim would be too plain to be denied, but unless there is some radical difference which we have failed to discover between those cases and that now before the court, the claim is equally absurd in this. The only reason why this absurdity is here less palpable is that the brake is not the whole railroad but only a part of it. But that certainly cannot affect the principle. For there is no more ground for assuming that the railroad puts into its own pocket the entire saving effected by one of the many devices used by it than there is for assuming that it puts into its pocket the entire saving effected by all these devices.

What then, it may be asked, is the actual profit to the road from the use of this brake and other similar devices; and how shall that profit be ascertained? There is one way, and as we believe, only one by which this can be done. That way is simple and definite; and perfectly easy of application. It is to take the *license fee* fixed by the patentee, and charge that to the defendant. The non-payment of that license fee is the only injury done to the plaintiff, and it is the only ascertainable profit made by the defendant. As this court says in *Mowry v. Whitney*, 14 Wall. 653, "The profits which are recoverable against an infringer of a patent are in fact a compensation for the injury the patentee has sustained from the invasion of his right. They are the measure of his damages. *Though called profits they are really damages.*"

So in *Seymour v. McCormick*, 16 How. 489, the court says, "The case of Stimpson's patent for a turn-out for a railroad may be cited as an example. It was the interest of the patentee that all railroads should use his invention, provided they paid him the price of his license. He could not make his profit by selling it as a complete and separate machine. An infringer of such a patent could not be liable to damages to the amount of the profits of his railroad, nor could the actual damages to the patentee be measured by any known ratio of the profits of the road. The only actual damage the patentee has suffered in such a case is the non-payment of the price he had put on his license, with interest and no more."

So in *Sanders v. Logan*, 2 Fish. 170, and again in *Livingston v. Jones*, Ib. 209, it was held by Grier J. that "if the inventor's profit consist neither in the exclusive use of the thing invented, or in the monopoly of making it for others to use, but in a general use by all who will pay the price of his license, the non-payment of the license fee is the only wrong done him. He has fixed his own measure of compensation."

It is true that in these three last cases it was a question of damages at law; but the same rule was laid down in *Amer. Nic. Pave. Co. v. City of Elizabeth*, 6 Off. Gaz. 766, which was a suit in equity; and finally, in *Burdell v. Denig*, 2 Otto, 270, this court has expressly declared that "in the absence of satisfactory evidence of either class in the forum to which it is most appropriate, the other may be resorted to, as one of the elements on which the damages or compensation may be ascertained."

There would be no difficulty here in fixing the license fee, for the patentee, as appears from his bill, has already licensed a large number of roads. Nor can it be pretended that the license fee so fixed would not be an adequate compensation, for it would yield at least half a million of dollars. We should thus be doing full justice to the plaintiff, and should at the same time escape the necessity of estimating his compensation on the theory of profits, the results of which, as we see in *Packet Co. v. Sickles*, 19 Wall. 618, have already awakened in the minds of this court a distrust that the prodigious finding in this case can hardly diminish.

Respectfully submitted,

GEORGE PAYSON,

Counsel for Defendant.

UNITED STATES SUPREME CO

CHICAGO AND NORTH-WESTERN RAILWAY CO

vs.

THOMAS SAYLES, *Appellee.*

ARGUMENT FOR APPELLANT.

BY B. C. COOK.

CHICAGO:
[illegible] & Co., Publishers, [illegible] Clark Street.
[illegible]

UNITED STATES SUPREME COURT.

CHICAGO & NORTH-WESTERN RAILWAY CO.,
Appellant,
vs.
THOMAS SAYLES.

ARGUMENT FOR APPELLANT,

BY B. C. COOK.

The main question in this case, whether the Tanner brake patent relied on by the plaintiff is a valid patent, and whether the use of the Stevens patent brake is an infringement of the Tanner brake patent, I do not intend myself to discuss; not because I have not full confidence in the contention of the defendant upon both these points, but because they are questions purely of patent law, and can be better discussed by counsel who have made that branch of the law a special study and are competent to discuss those questions in a much more satisfactory manner than I can hope to do. But there is one question in the case which rests on principles applicable to all suits in equity, to wit: the rule upon which the profits should be computed which are alleged to have been made by defendant by the use of the patent and to which the complainant claims to be entitled, which I wish briefly to discuss.

I suppose that there will be no dispute that the only inquiry to be made in ascertaining the amount which the complainant is entitled to recover in this case, assuming that he is entitled to recover at all, is what profits were actually made by defendant by the use of the Stevens brake on that portion of the road and for the time specified in the bill, and not profits which it might have made, but did not.

"The rule is based upon the idea that the infringer shall be converted into a trustee as to those profits for the owner of the patent which he infringes."

Burdell, et al., vs. Denig, et al., 92 *U. S. R.*, 720.
Cawood Patent (*Swedge Block Cases*,) 94 *U. S. R.*, 710.

I do not discuss the question whether a trust in a personal property can arise out of a simple tort without privity between the parties and without any intermeddling with a trust fund. It is sufficient for my present purpose to insist that the patentee's property is not converted into money until actual money or its commercial equivalent has come to defendant's hands, and it is only in respect of what has so come to its hands that the defendant can be sued in assumpsit or treated as a trustee *in inirtum.*

The defendant can be trustee only of some fund which it has actually made or saved by the use of the patented article; it cannot be a trustee of any fund which it has neither made or saved, although by different management it might have saved such fund.

Dean v. Mason, 20 *Howard*, 198.
Mowry vs. Whitney, 14 *Wall.*, 620.
Packet Company vs. Sickles, 19 *Wall:*, 611.
12 *American Law Review*, *No.* 2, *Jan.* 1878, *p.* 205.

There is no controversy at all between these parties as to what the actual facts are in relation to the use by defendant of the Stevens brake. The facts are stipulated as follows: (Record, pp. 849 and 850).

1611. UNITED STATES CIRCUIT COURT, NORTHERN DISTRICT OF ILLINOIS

THOS. SAYLES,
vs.
C. & N. W. R'Y. Co.
In Chancery.

It is hereby stipulated between the parties to the above entitled cause for the purpose of the hearing on complainant's claim for damages, that said defendants became a corporation and commenced running its cars and doing business on a portion of its railroad on the second day of June, 1859, and from that time until June 2d, 1864, used on all of its passenger trains in its said road double-acting car brakes, known as the Stevens Patent Brake; that such brakes were used on thirty-six eight wheeled cars running in its passenger trains, including all its passenger, baggage, and express cars. That it run four trains each day and six cars in each train on an average. That during said period said defendants run a mixed train daily, for freight and passengers, between Janesville and Chicago, being about ninety miles, on which there was usually one passenger car and one baggage, and that for one year during said period a similar train was run between Harvard and Rockford, the distance being about twenty-eight miles, and that the baggagemen on said two trains worked the brakes on said passenger and baggage cars. If extra passenger cars were run the conductors of said trains acted as brakesmen on the extra cars. The remainder of said thirty-six cars were in the shops for repairs or held in readiness for extra occasions. That each of said trains of six cars required and had two brakemen besides the baggagemen who acted as brakemen on all of said trains. That defendant paid its brakemen an average of thirty-four dollars and forty cents per month during said period of five years.

That during said period the actual cost of thirty-three inch wheels, such as were used under the said thirty-six cars, was sixteen dollars and seventy cents each wheel, and that the cost of taking off old wheels and putting new wheels on the axles, was one dollar each wheel.

That on the 2d day of June, 1864, said defendant consolidated its railroad and corporate franchises with the railroad and corporate franchises of the Galena & Chicago Union Railroad Company, and the new consolidated company retained the corporate name of the defendants.

(Signed) **WEST & BOND,**
Solicitors for Complainant.
H. W. BLODGETT,
Defendant's Attorney.

1613. U. S. CIRCUIT COURT, NORTHERN DISTRICT OF ILLINOIS.

THOMAS SAYLES,
vs.
THE C. & N. W. R'Y. Co.
} *In Chancery.*

It is hereby stipulated between the parties to this cause, by their respective counsel, as follows:

First. That the stipulation made herein between said parties, on the twentieth day of March, 1867, in reference to the number of brakemen employed by the above named defendants be amended, and it is now hereby stipulated that during all the time between the second day of June, 1859, and the second day of June, 1864, the said defendants employed on their railroad within said district, twelve regular brakemen for their passenger trains, beside the baggagemen on said passenger trains who also acted as brakemen.

Second. That during all of said time between the second day of June, 1859, and the second day of June, 1864, the said defendants used on their said railroad, at least two "way" or "caboose" cars in their various freight trains, each of which cars had upon it a "Stevens'" Double Acting Car-Brake.

Third. That during all said time, between the second day of June, 1859, and the second day of June, 1864, the said defendants removed the wheels of the thirty-six cars run in passenger trains on their said railroad, as per former stipulation, as often as once or twice a year, sometimes oftener, on account of flat spots, which rendered them unfit for passenger cars. Most of said wheels were then put under freight cars under the end of said freight cars that had no brake on.

Dated May 10th, 1873.

WEST & BOND, *Complainant's Solicitors.*
J. N. JEWETT, *Defendant's Solicitor.*

I have grouped all the evidence in the case which in my judgment has any bearing upon the question, whether the defendant did actually employ any less number of brakemen when it used the Stevens brake than it did when it used the single brake, and print the same as appendix "A" to this argument.

The finding of the Master upon which this decree was rendered, was as follows:

EXHIBIT "A" (Record, pp. 37 and 38.)

FIRST—*Brakemen Saved.*

For five years defendants ran constantly in passenger trains twenty-four cars, and required therefor twelve brakemen and four baggagemen, equaling in all sixteen brakemen.

The use of the patent is shown to have saved an equal number, that is, sixteen.

It is shown that on mixed trains defendants ran two cars, and required therefor one baggageman, equaling one brakeman.

The use of the patent saved here two brakemen.

On freight trains they ran two "caboose cars," requiring therefor two brakemen (or conductors).

The patent saved here two brakemen; making in all twenty brakemen saved.

The average wages of a brakeman for the time the patent was used, were thirty-four dollars and forty cents per month.

Wages of 20 brakemen would be $688 per month.

Wages of 20 brakemen would be $8,256 per year.

Wages of 20 brakemen for five years, $41,280.

I do not take into account the forward truck of the forward car of either of the defendant's passenger trains, which were four in number.

If the forward trucks were counted, the brakemen saved would be twenty-four instead of twenty.

Nor are the Harvard and Rockford mixed trains taken into account, which ran one year of the five, and on which two brakemen were saved by the patent.

SECOND— *Wheels Saved.*

For five years defendants ran constantly in passenger trains twenty-four cars.

On mixed trains they ran two cars.

On freight trains they ran two "caboose cars."

On Harvard and Rockford trains they ran for one year, two cars.

Equaling thirty cars per year for one year, and twenty-eight cars per year for four years; or,

Calling the wheels saved on the two caboose cars per year as equaling the wheels saved on one of the other cars per year, it may be stated as,

Twenty-nine cars for one year and twenty-seven cars for each of the other four years.

The patent saved two sets of wheels per car per year;

equaling fifty-eight sets saved for one year and two hundred and sixteen sets saved for the four years, or in all two hundred and seventy-four sets saved in five years.

Cost of a set of wheels was - -	$133.60
And of putting on a set - - -	8.00
Making cost of a set put on - -	141.60
Or for the whole 274 sets - -	$38,798.40
Value of old wheels, calling their average weight 500 lbs. -	$16,440.00
Deducting this amount, there is left for saving in wheels - - -	$22,358.40

In this estimate no account is made of any cars except those shown to have been constantly in use.

SUMMARY.

1st, Saving in brakemen - -	$41,280.00
2d, Saving in wheels - -	22,358.40
Total amount due complainant	$63,638.40

(Sixty-three thousand six hundred and thirty-eight dollars and forty cents.)

The Master reports that on the 4 passenger trains, defendant saved four brakemen on each train, or 16 in all. If this is so, then when those trains were run with a single brake they had 32 brakemen on the 4 trains, or 8 brakemen on each train of 6 cars. The baggage car was always one of the 6 cars in the train; on this car the baggageman operated the brake, leaving 7 brakemen for the other 5 cars. Now the truth is that not only is it not shown that the defendant ever had any more brakemen when it used the single brake than it had when it used the double brake, but it is affirmatively shown by persons who knew the facts, that it had not. Benjamin Garvin, the only witness who testifies directly upon this point, p 962, says that he was connected with the Chicago & Northwestern road, and it was not the custom of that road to use more brakemen with the single than with the double-acting brake. So far from there being any proof in the case that there was ever 7 brakemen used on the 5 passenger cars of defendants train, or that 8 brakemen were used on a train of 6 cars no witness on either side testifies that more than one brakeman to a car was ever used on any train on any road when single brakes were used. I submit to the Court that by no construction of the testimony in this case can it possibly be made to appear that defendant did in fact save 16 brakemen on its four passenger trains; on the contrary it is affirmatively shown that the number of brakemen was not diminished by the substitution of the double for the single brake.

The Master says: "It is shown that on mixed trains, defendants ran two cars and required therefor one baggageman, equaling one brakeman."

"The patent saved here two brakemen."

The meaning of this sentence I suppose to be, that it is shown by the stipulation, that after the double brake was adopted, defendant had but one brakeman, who, also, was baggageman, upon the baggage car and passenger car, and thereby saved two brakemen.

Now there is no testimony in the case tending to show that the defendant ever did, in fact, have two brakemen on that passenger car in addition to the baggageman who used the brake on his own car.

The Master says: "On freight trains they ran two caboose cars, requiring therefor two brakemen or conductors.

"The patent here saved two brakemen."

This is on the assumption that when the single brake was used the defendant had four brakemen upon these two caboose cars. There is no such testimony in the case; on the contrary it is shown that it did not.

It is shown by the proof that when the single brakes were used the baggagemen worked the brake on the baggage car, and the conductor of freight train acted as brakeman on caboose car when necessary, and after the double brake was put on they did not so act; and this is all the change proven. Not one man less was carried on the train to operate it.

The Master reports that half the baggagemen were saved. If this is so then no baggagemen at all are needed on a train using the Westinghouse brake.

Is it not evident that on every train a baggageman must be carried, and that, wholly independent of the question whether he does or does not operate a brake on the baggage car? (See testimony of H. B. Milliken, p. 916.)

According to the rule adopted by the Master, there was on the baggage car when the single brake was used, a baggageman and a brakeman; all the proof contradicts this assumption. As the Master finds that defendant saved

$200.64 by each of these (imaginary) brakemen saved by use of the patent, the defendant is charged with $41,280 on this account alone.

It is difficult for me to discover, from the testimony, what led the Master to the conclusion that these brakemen were actually saved by the use of the patent; but I suppose that it was the evidence that in the opinion of some of the witnesses it would take only half the number of men *to apply the double brake to a train* that would be required to apply the single brake with the same power and effect. There is certainly no other evidence in the case upon which the conclusion of the Master can be based, and he doubtless assumed that if it took only half as many men to work double brakes on a train as it did single brakes, that half the brakemen were saved.

This conclusion involves three fundamental errors:

1st. That the amount of whatever reductions could be made in the cost of running the trains was saved by the company.

2d. That the rate of speed and weight of cars in the times when single brakes were used, was substantially the same as during the time when double brakes were used and as much power was necessary to operate the brakes.

3d. That the service of brakemen was exclusively to work the brakes, and so when the brakes could be worked by fewer men, the train men whose services were no longer required to work the brakes could be dispensed with altogether.

Neither of these propositions are true in fact or established by the evidence, and no one practically acquainted with the running of trains would have assumed them to be true.

First. A portion of this road is in Illinois and a portion in Wisconsin ; in the latter State, the railroad company has not the power, by law, to fix the compensation which it shall receive for the use of its property and the services of its agents. This court has decided that this power is vested in the State, and the natural result is that the charge to the public for the transportation of freight and passengers must be regulated by the actual cost of such transportation at the time.

The affidavit of President Keep upon page 48 of the record, states the fact, "That no railroad company ever has, "or ever can, put into its own pocket the amount saved by "any improvement, patented or not, but is obliged, in fact "driven and compelled, constantly to reduce its rates, and "thus to share with the public the benefits and advantages "of every such invention and improvement."

It may be said that this affidavit is not evidence in this case upon this question. The answer is that it is a fair method of stating the argument, and the burden of proof to show the gain is upon complainant, and he has no right to assume that in the case of a corporation, "engaged in a public employment affecting the public interest," that all reductions in the cost of doing its business is a gain to the corporation itself. If the public have the right to fix the limit of the compensation it can receive, and then all patentees have the right to hold it liable as trustee for all reduction in the cost of transportation, regardless of the question whether the benefit of such reduction enured to the public or the company, it is placed between the upper and nether millstone.

The operation of the rule adopted by the Master may be shown by a simple illustration. A railroad company receives the sum of $25 for transporting a car load of freight from Chicago to New York, over its railroad. Had there been no railroad, and had the company contracted to carry the freight by wagons, or in some other manner, it would have received $100 therefor; has the company saved $75? Could it under any circumstances become a trustee for any person, of the $75 difference between the sum it actually received and the sum it would have received under other circumstances?

Second. The evidence conclusively shows that trains were not run at the same rate of speed, or the same weight of cars, when the single brakes were used, and consequently the amount of power required to work the brakes was not so great. The increase of speed is the aggregate result of many improvements. Perhaps the most important of these improvements is the substitution of steel for iron rails, the use of patent chairs, improvement in locomotives, in annealed car wheels, the Westinghouse brake and the Miller platform. The proof shows that the speed was not as great when single brakes were used, and does not show that the adoption of the double brake has been more than one of the least effective of many causes that have combined to make the increase of speed possible. I quote the testimony of a single witness on this point; there is no testimony in the case which conflicts with it.

Samuel J. Hayes, p. 960. "I would not consider it safe "now, with our present knowledge of railroad machinery, "to run passenger trains as they are now run, with the "same number of brakemen that were engaged on passen-"ger trains twenty years ago. The speed is greater now "than it was then; with an increased rate of speed an in-"creased number of brakemen is required.

THIRD. But the greatest error, in this mode of computing damages, is the assumption that the duties of a brakeman are only to man the brakes, and consequently that when a less number of men are required to work the brakes the number of men necessary for the running of a train is reduced by the same number; this is a fallacy. The error arises from calling these employes brakemen instead of train men, and assuming that their sole duty was to operate the brakes. It is necessary in the running of every train to have a sufficient number of men to guard the train at the place of starting, to prevent improper persons from entering the cars, to protect the property of the passengers, to render assistance to all persons requiring assistance in entering and leaving the cars; at every station there must be men enough to assist aged and infirm persons to alight. There must be men enough to see that persons do not enter the cars without tickets. There must be men enough, in case of any accident or detention, to send each way upon the track to signal advancing trains.

The law requires the use of the most efficient means to protect the person and property of passengers and holds railroad companies to a severe accountability for any failure in this regard.

N. O. St. L. & C. R. Co. vs. Burke, Sup't Ch. Miss., Oct. T. 1876, *Cent. Law Journal, June* 8, 1878.

Norwich Transportation Co. vs. Flint, 13 *Wall.*, 3.

Maverick vs. 8th Avenue R. R. Co., 20 *B. & C.*, 282.

Pittsburgh, F. W. & C. R. Co. vs. Hinds, 53 *Penn. St.*, 512.

The duties of the train men are also to assist in making up trains, keeping fires, lighting the cars, and during the time specified in the bill, one of their duties was to assist in wooding the engine. It certainly cannot be fairly assumed, without proof, that because fewer men were required on a train to operate brakes, that therefore that number of train men could be dispensed with. Upon the principle adopted by the Master in making this computation, no brakemen would be required now upon a train which has the Westinghouse brakes, for all the brakes are applied by the engineer, and yet the practical fact is that the same number of train men are required upon trains, that was required before the Westinghouse brake was used.

Samuel J. Hayes, who has been a practical railroad man since 1840, testifies, p. 960: "There was not any more "brakemen used with the old-fashioned brake, than with "the double brake on roads that I have been connected "with, nor had I noticed that there was in my observation "in passing over other roads. It has always been the custom to have two brakemen on an ordinary passenger train, "and it is still the custom."

To the same effect is the testimony of *Peter M. DeCamp*,

p. 920. *Louis Elder*, p. 921. *Benjamin Garvin*, p. 962. *John B. Adams*, p. 1,020. *Henry Waterman*, p. 1,126, testifies: "The only advantage of the air brakes over the "hand brakes is that the air brakes are in the first place "under the control of a single mind, and that they apply "the brakes to all the wheels of a train as nearly simul- "taneously as possible. I know of no other advantage, "*true the brakes work without a brakeman but yet the same* "*number of men would be required as the gang of a train.* "*I don't think it lessens the number.*"

The principle upon which the Master arrived at his conclusions applied universally would lead to strange results.

Among the improvements that have been patented in running a train are the following:

WAY.	Prior to 1874.	Since 1874.	Total.
Railroad ties, crossings, guards, cleaning track, turn tables, gates, etc.	741	120	861
Add wire fence patents		116	116
Rails, rail joints, chairs and nut locks, not including devices for mending rails such as Cawood's block	708	327	1035
Signals	86	102	188
Switches and Frogs	373	151	524
ROLLING STOCK.			
Cars and furniture *exclusive* of following items	492	439	931
Brakes and *attachments*	535	205	740
Wheels and trucks	503	125	628
Couplers and buffers	977	651	1628
Springs—special car and locomotive	199	38	237
Locomotive, boiler, blow offs, flues, gauge, condemn, feed water heaters &c., not including the following items, and excluding about 13000 on "steam engine" and patents of other titles, the exact number of which could not be ascertained without examining each patent	1276	475	1755
Fire box, grate and door	200	113	313
Smoke stack, exhaust, and spark arrester	239	73	312
Pistons, valves, and stuffing boxes	1433	364	1797
Lubrication, journals and axle boxes	865	347	1212
Tickets	69		69
	8696	3646	12342

Of which patents over ten thousand are now alive and operative.

Some of which are of the first importance in operating every road, such as the steel rail, the patent chair, the

Westinghouse brake, the annealed wheel, the Miller platform. The various improvements in locomotives.

If we are to assume that a railroad company has saved on its business all the sums by which the cost of operating a road has been reduced by these improvements severally upon the principle adopted by the Master in this case, we reach the extraordinary conclusion that the companies have severally, actually saved much more than their gross receipts; certainly much more than their net earnings, because the cost of transportation is not half as great as it was before any of the improvements were made.

But the rule adopted by the Master in arriving at the amount saved in car wheels is still more liable to objection. The stipulated facts are, that between June 2, 1859 and June 2, 1864, the defendants removed the wheels in thirty six cars run in passenger trains as often as once or twice a year, sometimes oftener, on account of flat spots which rendered them unfit for passenger cars. under the end of freight cars that had no brakes on. This was during the time that the double brakes were used. It is assumed that the patent saved two sets of wheels per car, per year, which would make four sets of wheels per year spoiled by the use of the single brake. Now, there is no testimony in the case showing or tending to show that defendants used four sets of wheels upon its passenger cars in a year at the time single brakes were used. There is testimony tending to show that on some roads using the single brake, from two to three sets of wheels were used. But the most singular fact is that the Master while determining that two sets of wheels per year were saved, gives credit for the value of the wheels as old iron only, while the stipulation which is all the proof upon this point in the case, shows that the wheels were put under the end of freight cars that had no brakes on. The Master has assumed that these wheels which were fit for and were used as freight car wheels, had no more value to the defendant than old iron; an assumption which seems to us unreasonable and absurd, but which is absolutely necesssary to support the finding in this case. It certainly appears from the stipulation that most of these wheels were suitable to be used as freight car wheels, and the fact is, that when a wheel began to be a little worn by the use of the brake they were taken off and put under the end of a freight car that had no brake, for the purpose of saving the wheel, and not because the wheel was worthless; when the wheel first began to be a little flattened at any point the wearing of the wheel would go on at that point much faster than before, but if the wheel was taken out and placed under the end of a car where there was no brake, it would do about the same service as a perfect wheel. Upon what principle could the Master say that a wheel which can be and is used on a freight car has no more value than old iron?

It is this loose and erroneous manner of computing profits that were never made—or saved, that swells this finding to proportions ruinous to defendant; the profits are assessed upon a small part of defendant's road only, and up to 1864. Another suit claiming $800,000 profits has been commenced against this company by this complainant, which is now pending. The person who purchased this patent has valid claims against the railroads of the country to the aggregate of $60,000,000 upon the same rule of ascertaining profits. (See affidavit of President Keep.) The complainant's own valuation of the patent is shown by his settlement with the Hudson River R. R. Co., giving that company the right to use the patent for $1,000. His verdict in an action at law against N. Y. Cent. R. R., was $1,500, (Rec., p. 606) and against the N. Y. & Erie, $75. (Rec., p. 637.)

In this connection, I desire to call the attention of the Court to the ruling of this Court in the case of *Packet Co. vs. Sickles*, 19 Wall., 617, it is there said that "The rule "in suits in equity of ascertaining by a reference to a Master the profits which the defendant has made by use of "the plaintiff's invention stands on a different principle. "It is that of converting the infringer into a trustee for the "patentee as regards the profits thus made, and the adjustment of these profits is subject to all the equitable considerations which are necessary to do complete justice "between the parties, many of which would be inappropriate in a trial by jury, with these corrected powers "in the hands of the Chancellor, the rule of assuming "profits as the ground work for estimating the compensation due from the infringer to the patentee, has produced "results calculated to suggest distrust of its universal application even in courts of equity." Certainly the rule should not be extended and enlarged to the extent that it must be if the Masters rule for computing damages in this case be sustained.

I submit that the rule for ascertaining profits in this case was erroneous, impracticable and oppressive. That no such profits as the Master has found were ever made or saved by the defendant.

Seymour vs. McCormick, 16 *How.* 272.

Corp. N. Y., vs. Ransom, 23 *How*. 490.

I ask leave to refer the Court to a full discussion of this question in the American Law Review for October, 1878, p. 1, title, "Money recoveries in patent suits."

This is not a case where defendant should be punished for any willful violation of complainant's rights.

The Stevens patent, the right to use which was purchased by defendant, was issued long before the Tanner patent was issued, and was being used while the application of Batchelder & Thompson was remaining in the patent office, and while the Commissioner of Patents was writing to them as follows:

PATENT OFFICE, Oct. 17, 1871.

GENTLEMEN:

Specifications and drawings of your alleged improvements in railroad car brakes are herewith returned for entire insufficiency. The office from what it can learn of the case cannot encourage you however to prosecute the application further. (See Record, p. 121).

Compelled to adopt the best improvements, yet left to decide almost in the dark, the managers of this company cannot be charged with willful disregard of complainant's rights because they failed to discover in the insufficient model, specifications and drawings of Batchelder & Thompson, the principle for which Stevens had obtained his patent.

B. C. COOK,

Gen'l Sol. of C. & N. W. R'y Co.

APPENDIX "A."

Testimony in relation to the question whether the defendant run its trains with any less number of brakemen after it began to use the Stevens patent brake, than it employed on the same trains before it used that brake.

Printed Record page 906. *Cyrus W. Burton.*

1*st Cross-question.* How many brakemen were employed on the passenger trains on the New Haven road run by you, as a general rule, when single brakes were used?

A. As a general rule, one to three cars.

2*nd Cross-q.* What number, as a general rule, were employed when they used the double brake?

A. The same number.

Page 907. 15*th Cross-q.* Do you mean to say that you have not run by a station for receiving and discharging passengers but once in six months?

A. I do; so as to be obliged to back up.

16*th Cross-q.* How many cars in such trains, and how many brakemen in the three months spoken of?

A. Six or seven cars, and two brakemen.

17*th Cross-q.* Would not, in your judgment, the result have been the same if you had had the single brake on the same cars, and four brakemen working and operating the brakes simultaneously?

A. Well, my judgment is, if you guarantee the four men to work simultaneously, I've no objection, but should prefer the other two; it might make a little difference.

Page 909. *James E. Hutton.*

Question 2. About how many years have you been running as locomotive engineer?

A. Well, about thirty years.

Question 3. Upon what railroads?

A. The New Jersey Railroad, the Erie Railroad, the Staten Island, the Harlem, the Charleston and North-eastern, the Charlotte and South Carolina, and the Texas and New Orleans.

Page 910. *Cross-q.* 1. How many brakemen were employed on the trains run by you when the single brake was used?

A. Sometimes one, sometimes two; according to the number of cars we had.

Cross-q. 2. How many brakemen, on an average?

A. I never knew more than two on one train when we run with a single brake.

Cross-q. 3. How many on an average were employed when the double brake was adopted?

A. They had about two to a train ; sometimes they had more.

19 A. I never run on any road where the single brake was used except the New Jersey and the Harlem road. On the Harlem road they used to run one to two cars in a train, and they had but one brakeman. On the New Jersey road they used to have about one brakeman to three cars. The New York train had three cars and two brakemen. The Philadelphia train had five or six cars and two brakemen.

Page 914. *John P. Ray. Cross-q.* 25. How many brakemen did they employ on a train when they used a single brake?

A. There is a difference in roads ; the average would be about one man to two cars.

Cross-q. 26. What was the average when the double brake was used?

A. They would use about one-third less brakemen.

Cross-q. 27. In the running of three to five cars, do they use more than two brakemen in either case?

A. I have known them to use three brakemen, the baggage-master being counted, and the conductor, too, sometimes ; that would make four brakemen with the single brake, two brakemen on the pay-roll ; with the single brake, the baggage-master and conductor would brake, whereas with the double brake they would not.

Page 916. *H. B. Milliken. Cross q.* 1. How many cars, as a general rule, made up a train on the Fitchburg road?

A. About five cars.

Cross-q. 2. How many brakemen were employed on those trains?

A. Two brakemen and a baggageman. In those times the baggageman almost always broke, and the conductor broke in those times; we also used to brake on the tenders. We don't ever brake on the tender now to stop at stations.

3 *Ans.* They had a single brake on each end.

4 *Cross-q.* Could not two brakemen, a baggageman and conductor control a train of four or five cars with a single brake, a fireman using a brake on the tender, do as good execution in stopping the train at stations, as two brakemen would with the double brake on the same number of cars?

A. No, I don't think they could.

5 *Cross-q.* Please give your reason for this answer.

A. The conductor or any one of them might put the brake on hard enough to slip the wheels, while another one might not put it on hard enough to do the necessary execution; while one man governing the whole eight wheels, one man is considered to apply to all the wheels of two cars, and the friction comes more regular on the wheels with the double-acting brake.

Page 920. *Peter M. DeCamp.* Locomotive engineer for a little over 25 years.

2 *Cross-q.* The number of brakemen employed when I was engineer, when they used single brakes, was a good deal owing to the number of cars. If we had two or three cars, we would have one brakeman beside the baggage master; when we had four or five cars, we would have two brakemen besides the baggage master.

Page 931. *Lewis Elder.* *Cross-q.* 3. The trains I ran numbered from six to nine cars. Three brakemen were employed on such trains, to the best of my recollection, when the double brake was used, and I think the same number and the baggage master in addition when the single brake was used.

Page 930. *Joshua P. Martin.* Worked as fireman and engineer since 1834 on several different roads. *Cross-q.* 3. On the Erie road when the single brake was in use the average number of cars in a train was five. We had a man to apply the brakes to each car; they were all applied by brakemen, baggageman, or conductor.

Page 958. *Nathan W. Huntley.* *Cross-q.* 1. It would require two brakemen to apply the brakes on all the wheels of two cars in a train with the so-called Tanner brake, as is now practiced by railroad companies. It would require three to apply the brakes to all the wheels of two cars in a train with a single brake, as usually practiced.

Page 959. *Thomas Hull*, *Q.* 4. I should put one brake man to every car on a train of passengers with the Stevens brake, to secure the highest degree of safety. It would require three brakemen to apply all the brakes to six cars with the Stevens or Tanner brake, and to apply all the brakes to such a train with the old single brake would require seven.

Page 960. *Samuel J. Hayes.* *Q.* 11. Served since 1840 on Baltimore & Ohio and Illinois Central Railroads. There was not any more brakemen used with the old-fashioned brake than with the double brake on roads I have been connected with, nor had I noticed that there was in my observation in passing over other roads. *It has always been the custom to have two brakemen on an ordinary passenger train, and it is still the custom.*

Cross-q. 4. It would take five brakemen to apply the brakes to all the wheels of such a train as quick as two would apply it with the double brake, but the same number of brakemen would apply all the brakes by passing through the cars; we used to consider it safe to depend on the brakemen passing through the cars, first applying the brake on one end of the car, and then on the other, that was the custom.

Cross-q. 15. According to the usual practice of applying the double acting brake to passenger trains, it would take double the number of brakemen to apply all the brakes at the same time with an odd number of cars; with an even number, it would take one more than double the number. I would not consider it safe now with our present knowledge of railroad machinery, to run passenger trains as they are now run with the same number of brakemen that were engaged on passenger trains, twenty years ago. The speed is greater now than it was then; with an increased rate of speed, an increased number of brakemen are required.

Page 962, *Benjamin Garvin;* connected with railroads

24 years, the Concord and Nashua, Northern New Hampshire, Vermont Central, and Chicago and North-Western. It was not the custom on those roads to use more brakemen with the single than with the double acting brake.

George L. Dunlap; was Superintendent of the Chicago and North Western Railway Company, from June, 1859 to June, 1864. The general practice was, they used more brakemen when the single brake was used than now.

Page 982. *F. D. Adams*, Car Builder, *Int.* 136. One additional brakeman with single brakes would handle a train as well as three brakemen would handle the train with the double brake.

Page 1020. *John B. Adams;* Railroad Conductor for thirty years. *Int.* 28. I can stop my train with three brakemen and single brakes on a dry rail as quick as I can with a double brake and three brakemen. If I had to change double brakes for single brakes on my train, I think an increase of one man to the number of brakemen on a train would be all that would be required.

Our trains in 1843, comprised only two cars, and occasionally three, with the crate car, and always carried two brakemen and baggageman, who broke on his own car as the number of cars on our train increased. We did not increase the number of brakemen while we used the single brake.

Page 1126. *Henry Waterman;* Mechanical Engineer, *Cross Int.* 72. The only advantage of the air brakes over the hand brakes, is that the air brakes are in the first place

under the control of a single mind, and that they apply the brakes to all the wheels of a train as nearly simultaneously as possible. I know of no other advantage; true, the brakes work without a brakeman, but yet the same number of men would be required as the gang of a train. I don't think it lessens the number.

No............ *Agenda No*........................

SUPREME COURT,

OF THE UNITED STATES.

CHICAGO & NORTH-WESTERN RAILWAY CO.,
Appellant.

vs.

THOMAS SAYLES, *Appellee.*

ARGUMENT FOR APPELLANT,

BY B. C. COOK.

Filed the..day of

....A. D., 187

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Clerk.

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United States Supreme Court.

The Chicago & Northwestern Railway Company
vs.
Thomas Sayles.
No. 48.

ARGUMENT FOR APPELLANT

BY

THE LATE B. R. CURTIS.

In the Circuit Court

May it please the court:

It has been already stated to your Honor that it is not my intention to discuss any of the controverted questions of fact involved in this case, and that I shall confine what remarks I have to make mainly to the subject of infringement. I desire, however, to submit to the court a few observations concerning the legal aspects of what was transacted in New Jersey in 1842 by Stanley and Tolson, without going into any disputed questions of fact, but upon the assumption that the facts are as they are assumed to be, or asserted to be, on the other side.

The time of these transactions is not in question. It was in 1842, and unquestionably prior in time to anything effectually done by Batchelder and Thompson; and the only question is, whether what was then done, so far as it is satisfactorily proved in this case, and is by the other side admitted to have been done, amounted, in contemplation of law, to an invention, so as to anticipate the invention of Batchelder and Thompson.

Now that which was done, which is clearly proved, and, as I understand, not controverted on the other side, is this: That Stanley conceived the idea of such a break as is now in question; that he made a model sufficient to exhibit the plan of such a brake, but, owing to its defective construction, not capable of being put into actual use and kept in actual use upon a car; that in the attempt to use it it was broken, taken off, and laid aside; that Tolson, who was an experienced constructor and the head of the mechanical department, under whose administration this experiment came, so far as the railroad was concerned in its trial, proceeded at once to put into iron the necessary parts of the plan indicated by Stanley; that he did so; that he duly proportioned those parts for size and strength; that he applied the thing thus made to a car; and several, precisely how many, trips were made by the car with this brake in use, does not appear. We offer evidence to confirm Tolson's statement that it was in use continuously for a considerable period of time; whereas it is insisted, on the other side, that the statement formerly made by him as a witness at Albany is the correct statement, and that this car having this brake upon it made but a few trips on the road—two or three—perhaps a little more, perhaps a little less.

Now, these are the uncontroverted facts in reference to what was done by these two persons at this time; and the question is, whether that does or does not amount, in contemplation of the patent law, to a completed invention, so as to anticipate the invention of Batchelder and Thompson, subsequently made.

There is, as I dare say your Honor has observed, a good deal of looseness among patent lawyers in the employment of the word "abandonment." They do not distinguish between abandonment of the pursuit of an invention and abandonment of an invention after it has been attained. If a person has conceived in his own mind the plan of an invention, and is proceeding by means of drawings or models, or actually working parts to endeavor to reduce it to practice, and before he has arrived at the point of its actual reduction to practice he abandons his attempt, he has, in contemplation of the patent law, done nothing. That is abandonment of the pursuit of an invention; and it anticipates no one who afterwards enters the same field and pursues the same plan up to the point of its reduction to actual practice.

On the other hand, if the pursuit has been so far prosecuted, either by one or more minds and hands, that the actual reduction of the plan to practice has been made, and the thing has been put into use, the invention is then complete; if then abandoned it is abandoned to the public; and it is abandoned to the public finally and as respects all persons who come afterwards, because, as the original inventor has the inchoate right to obtain a patent, when he abandons that inchoate right he abandons every right; and every subsequent inventor, although he may be an actual inventor, has no inchoate right to a patent, and if he obtains one it is void.

I have said, may it please your Honor, that if the invention is attained, if its pursuit is followed up to the point of attaining the invention, in contemplation of the patent law, by reducing the intellectual conception to actual practice, then the invention is made; and if an abandonment takes place, it is to the public. Was not that the case in this instance? Importance seems to be attached by the other side to the fact, which they assert—which we do not admit, we controvert it, but for the purpose of this argument I assume it to be true—that this car with this completed brake on it passed over the road but a few times. I attach no importance to this. If this plan was reduced to iron, the parts having the proper sizes and being properly put together, so that it could operate as a brake, and it was actually applied to a car and put in use, it is a complete invention and anticipates whatever comes afterwards; and if it is then abandoned, either because those who possess it do not understand its value, or because the circumstances in which they were placed did not render it valuable at that time to them or their employers, it is abandoned to the public, and no subsequent inventor can claim any right. Must not this be so, may it please your honor? If the learned counsel on the other side are not satisfied that a car making one trip with such a brake in actual use—that that amounts to a complete invention—how many trips must be made—what amount of use is necessary? Manifestly, the patent law has drawn no line, and contains no principle which gives any indication of the *amount* of practical use into which the subject-matter must be carried. What it demands for a complete invention is that there should be something more than the intellectual conception; that in addition to the intellectual conception of the plan there shall be a reduction of that conception to practice; that is all it demands; that is all it is possible for the law to demand in the way of practice, unless the legislature shall step in and make some arbitrary enactment as to the amount of use.

I submit, therefore, that on the uncontroverted facts as they were admitted by Mr. Cozzens here at the bar to be, when he said that Tolson told the truth at Albany, it appears that he there described a complete invention, reduced to practice, and put into use; and in confirmation of these views I beg leave to refer your Honor, instead of citing a case, to sections 87 and 91 in the last edition of Curtis on Patents, where the cases on this subject will be found to be collected, and the principles of law which I have been relying on are laid down and supported by the authorities. There is one very striking case there cited, which I wish to occupy a moment's time in stating to the court. It was a trial under a patent for a water-wheel, before Justice Nelson. A witness appeared who stated that at a certain time a person, whom he didn't know, who lived at a distance, applied to him, he being a millwright, to make a small water-wheel for him; that he described to him a plan of the water-wheel; that the millwright made it according to that plan; and the plan contained the same novelties on which the patent was founded; that the person who employed him appeared in due time and paid him for the water-wheel and took it away. He didn't prove any use of it; he didn't know that it was ever put into any use; and yet Mr. Justice Nelson told the jury that if they believed that statement, that was a complete invention, although it had only been put into a condition when it might be used—when it could be used—in the proper way and proper place; but it didn't appear that it had ever been thus attached or used at all.

I leave this part of the argument, may it please your Honor, and come to that which will require more comment—the subject of infringement.

I wish the Court, in the first place, to inquire what is *the class of* *inventions* to which it is claimed this patent belongs. Batchelder and Thompson do not claim that they were the inventors of railroad brakes; they disclaim that in so many words in their original specification. In the original specification they say, in so many words, they do not claim to have been the inventors of railroad brakes; and it is manifest they were not. Neither were they the first inventors of a mode of connecting the brakes between the two trucks. They point out in these specifications that they were not, and do not claim to have been the first inventors of a *mode* of connecting the brakes in railroad trucks. The mode which they here expressly disclaim is one where the momentum of the cars, or rather they have alluded to two different modes where the momentum of the cars, was employed, instead of the hand of the brakeman, to operate the brakes. But, nevertheless, the brakes in the two trucks were connected together by machinery, and they were so connected together, and so adapted to use, that instead of employing the hand of the brakeman the momentum of the car was employed. But the evidence in the case, may it please your Honor, carried the art of connecting the two brakes in the different trucks of a car much further than this.

In the first place, it appears by the testimony of Mr. Wilson Eddy, in the proofs used at the previous hearing of this case that a tender was made at Springfield, and put into use, having the brake lever of the forward truck connected with the brake lever of the hind truck; and the brake lever of the forward truck connected with a windlass, so that a person at the forward end of the tender could, by working the windlass by means of the connecting rod between the two brake levers, operate both at the same time.

I will read, if your Honor please, a short passage:

"In December, 1840, we had a severe accident here in Springfield, owing to the deficiency of the brakes of the engine and train. Coming down this grade (that is the grade in this city, there is a steep grade east of the city), an engine and train were badly smashed up, and four men lost their lives. When this engine and tender were repaired, and before it was put upon the road again, there were brakes put on both trucks of the tender; they are operated from one windlass, by a connecting rod, running from the top of the lever on the forward truck to the top of the lever on the rear truck. The lever on the first truck was operated by a windlass the same as a single brake, and the same as if a rear truck hadn't been connected with it. This tender went out of the shop in 1841, I think in May. Mr. Harris got up this brake, made it, and applied it to the tender. This brake has been used from that time constantly, on the tenders on this road, and is the one now in general use on our tenders."

Now, Mr. Whipple, I would be glad to have you exhibit to the Court a car to which a similar arrangement was applied there. Please to show that to the Court.

(Mr. Whipple produces a model.)

Your Honor will find, by looking at it, that instead of having one connection by a connecting rod, passing from the top of one brake lever to the top of the other brake lever, it has two connections. It differs from the description I have here simply in that fact. Now I will read the residue:

"The brake shown in the model now before the commissioner, marked 'model A' [that is the one before your Honor], was got up and applied to two crate cars by Mr. Harris, in 1842 or 1843, and, according to the best of my recollection, it was in use on those cars, as long as the cars were in use, which was some two or three years. I can't recollect the time exactly. When the cars went out of use, the necessity for that kind of double brakes went out with it."

Your Honor, of course, will understand that I am not about to argue that this anticipated the invention of Batchelder & Thompson. I am only endeavoring to show the Court *the field* as it existed when they entered it, when they made their invention; and we find, as I have already stated, it is proved by this evidence, that not only were they not the first to connect together in any manner the brake levers of the two trucks, but that they had been connected together at Springfield, by a connecting rod passing from the top of one brake lever to the top of the other brake lever, and also by two connections, as shown in the model which is now exhibited to the Court.

Further than this, may it please your honor, it appeared—and here it will not be necessary for me to read from this book, because your Honor doubtless will recollect accurately the evidence on the subject—it appeared that one Millholland had invented a still different mode of connecting the two systems of brakes prior to the invention of Batchelder and Thompson. He employed, instead of a center lever to make the connections, a drum with cords or chains—a pulley or drum, with cords or chains passing over it. Still I agree that this was different from Batchelder and Thompson; and perhaps did not anticipate the invention of Batchelder and Thompson; but at the same time *it approached exceeding near to their invention;* and with these three things before the Court, it is apparent that it was not for Batchelder and Thompson to claim, and that consistent with the truth of things they could not claim, that they were the first persons, *in any manner*, to connect the brake levers in the two trucks for the purpose of operating them from either end at pleasure, because it had been done before.

Well, what did remain to them—what was the field into which they could enter? Why, it was to devise some *novel*, *particular*, and *better* way of doing this same thing. That did remain to them. For the purpose of this argument I concede that they did so; that they entered this field and did devise *a particular mode of making this connection*, which differed substantially from any special mode that had been practised before; and that *for that particular mode which they* *thus invented* they could take their patent, but not for *the result* which was obtained, to wit, the connection of the two brake levers in the two trucks, so that they could be operated at either end; not *for any means whatever* of connecting the two, but strictly and exactly for *the particular means* which they devised, and for any other means which were *substantially the same.* And here I beg leave to read to your Honor, because the rule is there stated better than I can state it, a pssage from the opinion of Chief-Justice Taney in the case of O'Reilley and Morse in the 15 Howard: "But the discoverer that a certain useful result will be produced in any art, machine, manufacture, or composition of matter, by the use of certain means, is entitled to a patent for it, provided he specifies the means he uses in a manner so full and exact that any one skilled in the science to which it pertains, can, by using the means he specifies, produce the result he describes. If this cannot be done by the means he describes, the patent is void; if it can be done, then the patent confers on him the exclusive right to use the means he specifies to produce the result or effect he describes, and nothing more; and it makes no difference in this respect, whether the effect is produced by chemical agency or combination, or upon application of principles in natural philosophy, or by machinery acting upon mechanical principles. In either case, he must describe the manner and process as above mentioned, and the end that it accomplishes; and any one may lawfully accomplish the same end, without infringing the patent, if he uses means substantially different from those which are described."

Now, in reference to the state of the art which existed at the time of the invention made by Batchelder and Thompson, in reference to the field which they *could* occupy, in reference to what remained to be done in that field, I desire to read a passage from the case of McCormick *vs.* Talcott, in the 20th Howard, page 404:

"If he (that is the patentee) be the original inventor of the machine, called the divider, he will have a right to treat as infringers all who make dividers operating on the same principle and performing the same functions by analagous means or equivalent combinations, even though the infringing machine may be an improvement of the original and patentable as such. But if the invention be in itself but an inprovement on a known machine by a change of form or combination of parts, the patentee cannot treat another as an infringer who has improved the original machine by the use of a different form or combination, although performing the same functions. The inventor of the first improvement cannot invoke the doctrine of equivalents to suppress all other improvements, unless they are mere colorable invasions of the first."

Now these cases are decisions of the highest authority; they are the law of this Court, of course; I desire to ask your Honor to apply these principles to the facts of this case; and in order to do so it will be necessary for me, somewhat tediously I fear, to go through with a statement of what are the various parts of these two arrangements; what are the functions of each of those parts, and what are the effects or results which they produce; and to trace those diversities of effect to those diversities of construction and of function in the two machines. Your Honor is quite familiar with both structures, and therefore I apprehend that it will not be necessary to look upon the models. If your Honor desires to do so, they shall be placed before you.

What Batchelder and Thompson did was this: they took the existing truck, which had a brake lever, the short arm of which was attached to one of the brake bars, and the other brake bar, through its connection with the lever, was made the fulcrum of that lever. The top of this lever was connected with a windlass; of course the lever stood on the outside of the truck, near the windlass, its top connected to the windlass, its short arm connected to the brake bar, which was nearest to the windlass; there being a connecting rod from the brake lever to the other brake bar, so that the other brake bar, through this rod, acted as a fulcrum of that lever. Batchelder and Thomson found that arrangement in operation in the trucks, and they turned the trucks round, so to speak, or shifted the lever from the outside of the truck to the inside of the truck. In all other respects *the operation of the lever within the truck* remained the same as before. It was still attached by its short arm to one brake bar, and by its fulcrum to the other brake-bar; but it was no longer attached to the windlass. They introduced a center lever, attached to the body of the car, and the arms of this center lever were connected with the windlasses at either end—one arm to one windlass, the other arm to the other windlass; and they also connected this center lever with each brake-lever in such manner that when the center lever was acted upon by either windlass, *it received the power of the windlass and distributed it between the trucks*, sending one part of the power to one truck and the other part of the power to the other truck, and that power when sent to the several trucks was received on the brake-lever of each truck, which was thus actuated through the center lever instead of being actuated, as they were before, by the direct action of the windlass. This shows the structure and operation of what Batchelder and Thompson did.

Now this structure and mode of operation were attended with certain defects. First of all, as is apparent must be the case, the attachment of the brake-lever by its short arm to one brake bar and by its fulcrum to the other brake-bar necessarily exerts upon the different brake-bars unequal forces. That exerted by the fulcrum of the lever must be equal to that which is exerted by the windlass and by the short arm, inasmuch as it sustains both powers or weights, or whatever you choose to consider them. There was therefore introduced by means of this arrangement this inequality, so that a very much greater amount of power was thrown upon one pair of wheels in the truck than was thrown upon the other pair of wheels.

But this was not all, nor is it perhaps the most serious difficulty, though one of no trifling character. The center lever, as I have already stated, received and transmitted all the power, and distributed it between the two trucks; this center lever is attached to the body of the car by a bolt; of course when one of its arms is prevented from vibrating the other arm is prevented from vibrating. Now suppose the set of shoes in one truck is but little worn, and the set of shoes in the other truck is more worn; that they are unequally worn in the different trucks; when the brakes are set up, by the windlass, the center lever, distributing the power of the windlass to the brakes which are less worn, brings them in contact with the wheel, and as soon as they come in contact with the wheel, the other arm of the lever cannot move, and therefore it cannot move its brake-bar up, so as to apply the more worn shoes to the wheels in that truck at all; and this is attributable to and necessarily follows, as your Honor sees, from the fact that there is a *permanent fixed connection by a bolt between this distributing lever in the center and the body of the car*, which bolt is the *point of resistance of the whole system.*

There is another difficulty also arising out of this arrangement, and that is, that when the brakes are set up, and while they are thus set up, if the cars strike a curve, striking the curve causes the trucks to swivel; they change their relative position to this center lever, which cannot change its position, owing to the fact that it is attached to the body of the car by this fixed bolt, and that both or one of its arms is fixed in its position by the brake which is in contact with the wheels at the time. The trucks change their relative position to this center lever, and the consequence of it is, that the shoes in one truck are brought nearer to the end of the center lever, and greater pressure is thus exerted upon them; whereas, the other set of trucks are thrown further off and less pressure is brought to bear upon them, so that in going from a straight track and striking a curve with the brakes set up, or from a curve to a straight track, so that the relative position of the trucks and the center lever, which existed when the brakes were set up, is changed by reason of the swiveling of the trucks; then comes this difficulty, that you throw an increased force on one of the trucks, and you take off the brakes altogether, or mainly from the other truck, and that, too, at the moment when it is most essential that there should be nothing unsteady or abnormal in the operation of the trucks. Now these defects, which I have thus pointed out, are the necessary results or incidents of the mode of construction and operation, which was adopted.

Let us now turn to the other, the Stevens. We find that Stevens did not turn the trucks round. He retained the outside brake-lever, in its connection with the windlass, and he retained it in its connection with the windlass by the short arm of that lever; but he did not connect that lever with the opposite brake-bar, to act as a fulcrum of that lever, as was done in the old form, and was adopted by these patentees.

He connected that lever with a second brake-lever *which he introduced into the truck*, and that second brake lever, introduced into the truck, had its short arm of the same length as the lever connected with its brake-bar. So that your Honor perceives that, having done that to both the trucks, *he had a different system inside each of the trucks.* Your honor will bear in mind that the problem which we are discussing here is *the mode of connection of the* brakes in two trucks. The things to be connected are the brake-system in one truck with the brake-system in another truck. Now, Stevens began by *modifying the brake-systems in the trucks;* not in form merely, because, as your Honor perceives, by using these two levers in the trucks he gets an equality of force on the wheels. He does not rely upon the brake-bar as the fulcrum of this single lever, and thus throw much greater power upon that set of wheels than was thrown by the short arm of the lever upon the other set, but he has introduced a second lever with a second short arm, to exert the same power on that brake-bar that is exerted by the first lever upon its brake-bar; and if you suppose no connection to exist whatever between the trucks, suppose there is no connecting-rod, and they are to be operated after the old fashion, by two brakemen, one at each end and each acting on the windlass, it is a different thing from what existed before—a substantially different thing. Before, there was inequality of force thrown upon the wheels; now, by this new arrangement of levers, and by getting these new attachments, he has made an equality of force. What next, may it please your Honor? Why, having thus modified the leverage in the trucks, he had nothing else in the world to do but *to connect the two systems together*, *not by a center lever attached to the car*, but by a rod, and that was done :and then the whole thing exists. I have already shown how he got the equality of force *in the trucks.* Now, by means of this rod, *not by a center lever*, *he gets equality of force between the trucks.* But, as your Honor will perceive, in the case of Batchelder & Thompson, they have a center lever there, the office of which center lever is to receive the whole power and *distribute it between the trucks;* the office of this rod is nothing in the world but to transmit the power—the whole power that is sent onward, transmitted to the next pair of levers—and it is not only therefore a different structure—there is not only employed a rod, a straight rod, in the place of a center lever—but the function of that rod is different from the function of the center lever; and so when you go to the next truck you find the power applied on the wheels with the same force on each pair, so that throughout the whole arrangement there is equality of force; and when you come to the inequality of the wear of the brake-shoes, owing to the mode in which he has modified the leverage *in* the trucks and *the mode in which he has connected that leverage by a rod*, *a floating rod*, so to speak, there is no difficulty in breaking up the unequally worn shoes so that they will bear upon the wheels in going from a straight line to a curve, or from a curve to a straight line; there is no difficulty owing to this change of position of the different brakes relatively to each other, *because there is no fixed lever interposed whose relation to them renders it necessary that it should change as they change* in order to make the power equal on the trucks or keep it equal. When the trucks swivel, this rod swivels with them. It is a loose system, so to speak, instead of being attached to the body of a car by a bolt in such a rigid manner that it cannot yield when going from a straight line to a curve, or from a curve to a straight line.

Well, may it please your Honor, if these things be so, then isn't it true, in point of fact, that when we come to compare one of these systems with the other, we find, in the first place, that the *construction of one* is different from the construction of the other; that the *number* of parts is not the same; the *positions* of the parts are not the same; the *functions* of the parts are not the same; the *effect* of each part and the *effects of the whole* are not the same, And if this be true —and I see no possible escape from it—then is it, or can it, also be true that one of these two things is substantially the same as the other—that one is a mere colorable copy of the other—for your Honor will remember the rule laid down, that inasmuch as these patentees only had this narrow field of devising *some particular way* to make this connection between the two trucks, they could hold their way, but nothing outside of it. *They must show that this thing complained of includes substantially the same thing as the thing they* have made and patented; but can it include substantially the same thing when theirs is one system and *the defendant's is throughout a different system*—different in its structure, different in its functions, different in its mode of operation, different in its effects? When there is no one part in the Batchelder and Thompson which is found in form, position, functions, or effect, like any corresponding or other part in the Stevens, I respectfully submit it is a legal impossibility that one of those things should infringe upon the other when the patent is construed in the manner I have endeavored to show it should be.

I do not understand from the very brief opening which was made yesterday that the learned counsel on the other side would attempt to controvert these views, provided the patent is to receive the construction we contend for. If when this patentee says in his summing up, "what is claimed by us is, to so combine the brakes of the two trucks with the operative windlasses or their equivalents at both ends of the car by means of a vibrating lever or its equivalent, or mechanism essentially as specified, as to enable the brakeman," &c., he is understood to claim his *described system* of connecting the two trucks; if that is the meaning and legal effect of it, then a comparison of the two systems shows ours is not substantially the same as what is here described and claimed. But, says the learned counsel, this claim covers a wider field; the proper construction of this claim is such that it covers not only the particular method described, of making connections of the system described by means of the center lever as described, but it covers any method of making any connection of any system *by leverage power*. That is his claim, and I do not see how he can stop short of it. The moment you come to inquire whether the two things are substantially alike *viewed as units*, viewed as a whole, it is manifest they are not alike; therefore they fix upon this similar feature in the two, not that both connect by a lever, for we do not, but that *both employ lever power*, and out of that similarity is to be constructed a sufficiently broad foundation on which to rest a decree of infringement; simply because each employs in his way one of the elementary powers in mechanics; because we employed in our own way, and in a substantially different way from theirs, the same elementary power in mechanics, obtaining thereby different results from theirs, that therefore we infringe the patent; as if this patent had been taken out to read, "What we claim as our invention and seek to patent is, combining the brakes of two trucks with the operative windlasses, or their equivalents, at both ends of the car by means of the vibrating lever A, or its equivalent, or mechanism essentially as specified, *or any other mechanism, no matter what it is, provided lever power is employed*"—not in making the connection, but in any manner—I respectfully submit that if they will modify their patent in that way, it will stand but a very short time—only long enough to receive a proper degree of judicial consideration. I look upon this patent, may it please your Honor, as being what it purports to be, a patent *for a particularly described method of connecting a described system of leverage in the trucks.* If ours is substantially the same, we infringe it; if ours is substantially different in its construction, in its mode of operation, and in its effects, we do not infringe it; and that ours is thus different, I think, cannot be doubted.

May it please your Honor, it does seem to me that this Court has decided this question already. When the validity of the Stevens patent was in issue before your Honor, this Batchelder and Thompson patent was relied upon as anticipating it, and your Honor decided it did not, because it did not cover the same invention; as appears from your Honor's opinion in the 2d Fisher's R., it was held that the Stevens patent was for a different combination from that shown by Batchelder and Thompson. The opinion, as here published, or rather the results of the opinion, do not contain any of the reasoning of the Court upon the subject, and therefore I am obliged to presume that your Honor went through an examination and comparison of the different parts of this machine, similar to the one that I have endeavored to present to the Court; and that the result of that examination and comparison was, that the one viewed as a unit was substantially different from the other. If that be so, then their patent cannot be infringed. If they have a patent for one particular mode of connecting the two trucks, and we have a patent for another mode of connecting the two trucks, and the Court has come to the conclusion that one is substantially different from the ohter, what remains to them? Why, it remains to them only to show that that other is substantially different, because, although it has borrowed the whole of their arrangement, it has added something to it. That is the only remaining inquiry. There are only two possible suppositions; one is that we have made a combination of our own which does not include theirs; the other is that we have made a combination of our own which does not include theirs, *but has added something to it.* I have endeavored to show your Honor that *each is a unit*, that *there is no possibility of conceiving of any addition or subtraction.* The two things are wholly unlike from beginning to end. Each is a system wholly unlike the other. You cannot possibly start and advance up to a certain point and say, "To this point Batchelder and Thompson have gone, and the rest Stevens did." Stevens did the whole or he did nothing. Viewed as a system, either this is wholly new, or else it is wholly old, because it is like Batchelder and Thompson's, and this Court has decided that it was not anticipated by Batchelder and Thompson, that it is a different combination; not using the word combination technically, but as describing an organized whole. I respectfully submit there is no escape from the conclusion that it does not infringe this patent of Batchelder and Thompson.

I believe, may it please your Honor, that these are all the observations I deem it necessary to address to the Court. Thanking your Honor for your kind attention, I will cease to task your patience further.

SUPREME COURT OF THE U.S.

October Term, 1878.—No. 48.

THE CHICAGO & NORTHWESTERN RAILROAD COMPANY,
Appellant,
versus
THOMAS SAYLES.

BRIEF FOR APPELLEE.

S. D. COZZENS,
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The Chicago and Northwestern Railway Company,
[illegible]
The Chicago & Northwestern [illegible]
vs.
[illegible]

BRIEF FOR APPELLEE

[illegible]

[illegible] appellants that [illegible] Record, p. 2 [illegible]

The [illegible] was [illegible] of December, 18 [illegible]

[illegible]

Supreme Court of the United States.

THE CHICAGO AND NORTHWESTERN RAILROAD COMPANY,
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BRIEF FOR APPELLEE.

Review of the Litigation.

A summary, however brief, of the litigation which has been had on the patent involved in this case necessitates mention of what is known as the "Albany trial." That was a suit brought by Tanner, the patentee, within a few months after the patent was granted, against The New York and Erie Railroad Company for infringement. Tanner also brought a similar suit against The Hudson River Railroad Company about the same time. These two Corporations united to resist the patent, and the suit against the Erie Road was tried. The trial took place at Albany, before Judge N. K. Hall and a jury, in October, 1854. Eminent counsel were engaged in it on the part of the infringers ; and the brakes known as the "Springfield Brake," the "Nichols Brake," and the "Stanley" or "Stanley-Talson Brake," were set up against the novelty of the invention. The question whether the "Stevens" brake—which is the form of infringement used by the present appellants—was a violation of the patent, was also one of the issues in that case. The trial ended in a verdict that the patent was valid, and that the Stevens brake infringed it. (Bill—Printed Record, p. 7.)

But the "Millholland" brake was not before that Court, and consequently other infringers claimed that it was a defense. And when Sayles sued these appellants, they set it up. (Answer—Record, p. 29.)

The present suit was brought on the 28th of December, 1861, but in consequence of delays in the lower Court a decree was not made in it until 1875. After this, the appellants claimed to have discovered an entirely new defense —the alleged "Tyler Car"—and to have obtained fresh light on an old one the "Stanley-Talson" brake—and the Court below was persuaded to set aside the decree mentioned and let the appellants set up these further matters. A long time was unavoidably consumed in completing the proofs on them, and the cause in its new aspect could not be brought to hearing in the Circuit Court until May, 1869. That Court delayed its decision two years and two months, so that the second interlocutory decree could not be entered until July, 1871.

A persistent contest then ensued before the Master, but his Report was filed July 31st, 1873, whereupon another delay of about a year and a half was made by the Circuit Judge in passing on the Exceptions and other efforts of the appellants to rid themselves of the amount reported against them.

It is for these reasons that the final decree from which this appeal comes up was not entered until September, 1875.

Special attention is asked to the fact that the appellants were well acquainted with the Albany trial, the issues in it and the result of it, (Answer—Record, p. 28), and that not until the *second* hearing in this case, in May, 1869, did they—beaten on all other points as up to that time they were—raise the question that they had not infringed the patent.

The Invention which Batchelder and Thompson made Defined.

Batchelder and Thompson invented the first successful "Double-acting Car-Brake."

A double-acting brake is a mechanism for stopping a railroad car by which a brakeman can apply the brake-shoes simultaneously to all the wheels of one car from either end of the car.

To ascertain the precise addition which they made to the railroad system, the first inquiry necessary is as to the state of the art prior to October, 1846, when their invention was completed.

Railroad cars are unavoidably of great weight, and when run in trains at locomotive speed the inertia of the moving mass is so great that the locotive with its steam entirely shut off is insufficient to present the required resistance to stop the train within a reasonably short distance at the various stopping places along the line of road, or to avoid collisions or other disasters when impediments are noticed on the track by the engineer. It is therefore necessary to apply friction to the periphery of the wheels to impede their turning, and thereby present sufficient resistance to stop the train within the shortest practical space—the shorter the better provided it be not too sudden to injure the cars.

The mechanism by which friction is applied to the wheels of a car for this purpose is termed a railroad car brake. Friction is made against the periphery of the wheels by blocks of wood or iron, termed shoes, in the form of segments fitting the periphery of the wheels, and so connected with each other and with a windlass or lever on the platforms of the car that the brakeman, stationed on the platform of the car, can at a given signal, such as a sharp whistle of the locomotive, operate the windlass or lever on the platform and thereby force the shoes or segments into contact with the periphery of the wheels.

For a long time in the use of railroads, the cars were on four wheels, with the two axles parallel, the wheels being permanently attached in pairs to, and turning with, the axles. The earliest of these cars had no brakes at all. Trains were stopped at first by inertia, then, as the next step, by the locomotive. As the railroad system advanced, brakes were employed, but for a long time the friction shoes applied to only one pair of wheels. Afterwards, the shoes were attached in pairs to each of two "brake-beams" or "brake-bars," and these latter were suitably hinged to the frame of the car and suspended on one side of the pairs of wheels, and were connected with each other and with the windlass on the platform, so as to enable the brakeman by operating the windlass to force the two pairs of shoes into contact with the two pairs of wheels at the same time.

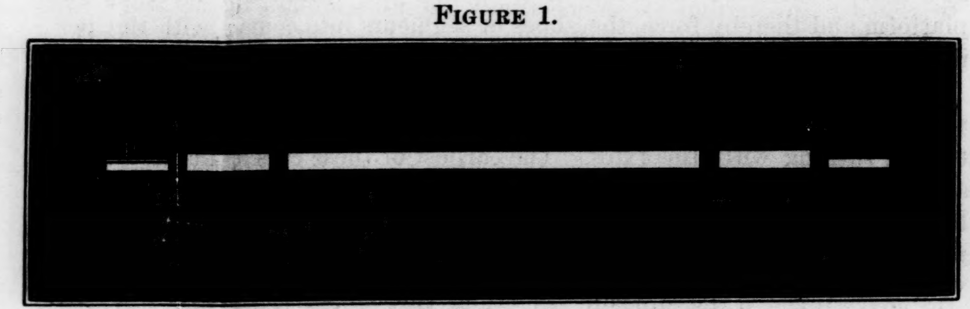
In the progress of improvement the mode of construction of railroad cars was changed. Four-wheeled cars were found to be ill adapted to our system of curved roads, and thereupon cars were, and are now almost universally, constructed to run on eight wheels. Two four-wheeled trucks or bearing carriages are connected each by a central or king-bolt with, and near the ends of, a long car body, so that they can turn freely under it to follow the curvatures of the road. The two axles in each of the two bearing carriages are always parallel, but the axles of either of the bearing carriages are only parallel with the axles of the other bearing carriage when the car is running on the straight portions of the track. At all other times they are not parallel, but are constantly changing their relations to each other as the curvature of the road varies.

It is important to bear in mind the above peculiarity of the double truck eight-wheeled cars used upon our railroads, for the invention at issue relates to a mechanism intended to apply friction simultaneously to all these eight wheels from either end of the car.

When eight-wheeled cars were first introduced, and for several years thereafter, the brakes for making friction on the wheels were applied as they had been at first applied to four-wheeled cars—that is to say, on only the wheels at one end of the car; the sole difference being that while in the four-wheeled cars there could be but one pair of wheels towards one end of the car, so that when the brakes were applied at only that end they could make friction on only one *pair* of wheels, in the eight-wheeled car there is a *truck* containing *two* pairs of wheels at each end of the car, so that when the brakes were applied at one end they could make friction upon two pairs of wheels. In other words, the earliest eight-wheel cars applied the brakes to as many wheels as the four-wheel cars did in the latest condition of the latter, but they still applied to only one end.

Figure 1 is an accurate representation of one of these early eight-wheel cars.

FIGURE 1.

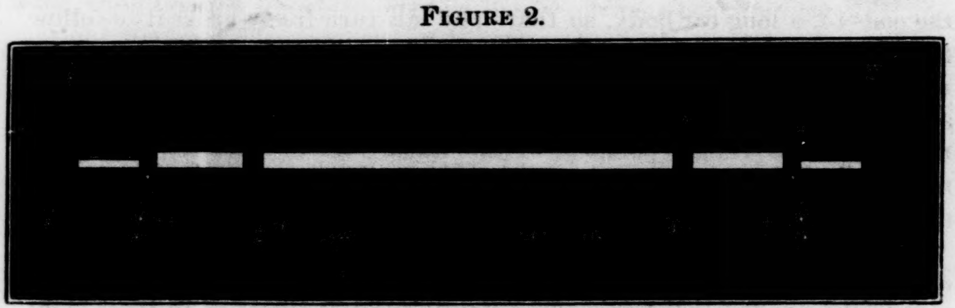


The Old Single Brake—on One Truck.

In this Figure the friction shoes are shown at s, the brake-bars at b, the rod which connected the two brake-bars, at o, and the windlass, the chain and rod, and the lever, by which the brakeman forced the two pairs of shoes into contact with the wheels, at W, r, and L, respectively. P represents the car platform, and B the long car body.

By degrees, however, this same arrangement was duplicated at the other end of the car, as seen in Figure 2.

FIGURE 2.



The Old Single Brake—on Both Trucks.

But still the brakes at each end of the car were applied separately, and independently of each other. For this reason they were termed "single" brakes, because operating on only a single truck, and it is obvious that to apply all the brakes of such a car simultaneously, there must be a brakeman at each end of the car when only one car was run. But when two cars were run in a train, three brakemen were required, one at the front end of the forward car, a second at the rear end of the rear car, and a third between the two cars, who, after operating and securing the windlass of one of the cars, would pass to the adjacent platform of the other car and there perform the like operation. And in that proportion brakemen were needed for trains of any other number of cars.

Besides requiring so many men, these single brakes had an inherent controlling defect.

The windlasses of an eight-wheel car are necessarily placed on one side of the longitudinal centre line of the car. This is done that they may not interfere with the central passage way through the cars and through the train. It is also requisite that the connection from the windlass to the truck lever of the single brake should be in a line parallel or nearly so to the length of the car, in order that the truck lever may work properly. Hence any swiveling of the truck on curves would change the relation of the top of the truck lever—which is attached to the truck—to the windlass which is attached to the body of the car, so that when the brake is applied and the car passes over a curve which turns in one direction, this connection would be so much loosened as to materially slacken the pressure of the brake shoes on the wheels and thereby prevent the brake from acting efficiently; and if the curve turns in the opposite direction, the connection would be so much tightened as to cause the shoes to grip the wheels so closely that they would slide on the track, and when that occurs not only are the wheels injured but the brake becomes of no use, and the car can only be stopped when its momentum is spent. When—as is often the case—the curve is a "reverse" one, like the letter S, one end of the car as it reaches the beginning of the curve will have its brake loosened, while at the other end not yet off the straight track the brake will be properly applied; and by the time this rear end reaches the curve and its brake becomes loosened, the forward end will reach the end of the curve and turning in the opposite direction will have its brake so tightened that the wheels will slide. It was impossible to proportion the parts of the single brake in any manner which would prevent these difficulties.

The employment of so many brakemen, with the single brake, especially on roads doing a large business, was a source of expense, and it naturally became a desideratum to reduce the number, and at the same time have the cars braked more efficiently. The problem to be solved was to connect the brakes of the two four-wheel trucks, notwithstanding their constant change of parallelism with each other and with the windlasses at both ends of a car, in such a manner that a brakeman at either end of the car could at one operation apply the four pairs of shoes to the four pairs of wheels of one car and insure the making friction on all of them simultaneously. This problem, when solved, would materially reduce the number of brakemen needed and thereby materially reduce the expense of running trains. For a single car but one brakeman would be required, instead of two; for a train of two cars but one would be required, instead of three—for being placed between the two cars he could after operating one windlass to make friction on the eight wheels of one car, pass to the other platform and make friction on the eight wheels of the other car; for a train of four cars but two brakemen would be required—one between the first and second cars and the other between the third and fourth cars; and in that proportion for any number of cars.

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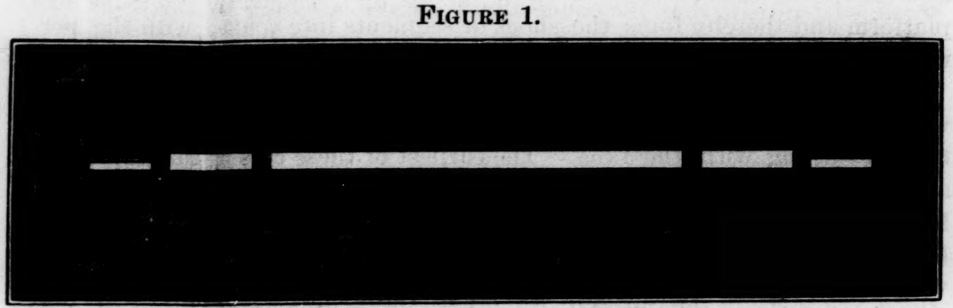

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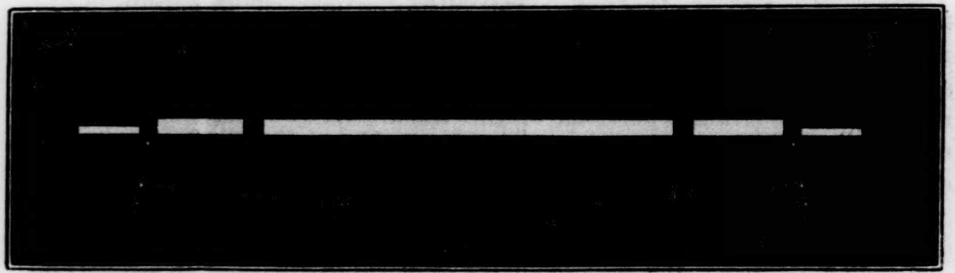

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Such was the problem to be solved, and such the inducement which commended it to ingenious men. That many unsuccessful attempts were made before it was successfully solved will become apparent to the court from the evidence in this case.

The task at first view appears an easy one. In point of fact it was very difficult.

The difficulty arose mainly out of the complicated conditions under which car brakes must in actual practice be used, in consequence of the frequent swiveling of the car trucks caused by the curves in the railroads. It was increased by the high speed at which passenger trains must be run, and the frequent stops which they must make.

In England this difficulty would not have existed to anything like the same extent that it did in this country, because there, owing to the greater accumulation of capital, larger sums were at the disposal of railroad projectors, and railroads were built more like the engineer's ideally perfect road—that is, as near to a straight line as possible. A high authority says: "An English road was virtually a straight road; an American road had curves sometimes of as small a radius as 200 feet." But to build the English railroads straight involved vast expense, for natural obstacles had to be overcome—hills to be tunneled or cut through, valleys to be filled up or crossed at great height, morasses to be made solid ground, and all the resources of the most eminent constructors—the Brunels, the Stephensons and the Rennies—resorted to In this country capital was less abundant, populations in many sections were sparse, natural obstacles—except in the prairie States—were greater, and the lines were of necessity much longer. To build as cheaply as possible was the first requirement, for the country had to be developed and the hoped-for business of the road created. Hence the engineers laid out the lines around the hills and mountains instead of through them, and made many a *detour* because it was cheaper than the costly structures which would have made straight routes possible. A striking instance of this is the well known "Horseshoe Bend" on the Pennsylvania Railroad. In Great Britain, deep valleys such as those at that spot would have been crossed by magnificent viaducts like that at Congleton, or like the longest piece of railroad masonry in the world, the Ballochmyle Viaduct on the Glasgow and South-Western Railway. Here, the very able engineer who constructed the Pennsylvania Road, lengthened his line by miles and wound it round and round the mountain till in more than one place it doubles on itself—producing the "Horseshoe Bend"—that he might avoid the expense of making it straight by crossing the valleys directly. On many railroads in this country travel is made specially disagreeable by the constant curves which the cars have to pass over, so that if a passenger leaves his seat he finds it to be an achievement to keep his balance. Examples of such roads are the Central Ohio, the Pennsylvania Central, the Northern Central, and the Baltimore and Ohio.

It was under such conditions, coupled with the difficulties arising from high speeds and frequent stops, that the problem of a successful double brake for eight-wheel cars had to be worked out.

It is strenuously insisted by the defendants that a double brake is merely two single brakes connected together. At a first glance this might seem to be so, and that to do it was all that was necessary to make a double brake But such a view is quite erroneous. It is impossible to make a successful double brake by merely connecting two single brakes. Such an effort was made in the "Springfield Crate Car Brake" and failed, some years before Batchelder and Thompson entered this field of invention. That brake was specifically two single brakes connected to the same windlass shaft. It is accurately represented in Figure 3.

FIGURE 3.

The Springfield "Crate Car" Brake.

It will be seen that a short chain, c, and a longer chain above it with a rod attached to the latter, run from each windlass, one to one single brake and the other to the other single brake of the car. Hence the brakeman when he operates the windlass would apparently apply both these single brakes simultaneously. This might possibly be so in fact, if the Springfield car ran always on a *straight* railroad and never on a curved one. But no car can do that, and when the Springfield car went into actual use—on straight track and curves alike—the defects of the brake became of such serious consequence that, as will presently appear, they caused it to be abandoned and thrown aside as a hopeless failure.

A few words will make these defects plain. The two chains which connected each of the windlasses with the two single brakes have been pointed out. In practice it was found that when attempts were made to apply the brake, these double chains would override each other so much on each windlass *as to prevent the brake from operating*. Besides this, as the chains were necessarily of unequal lengths, because one went to the truck nearest to the windlass whence it started—and was consequently quite short, only about fourteen inches—while the other went to the truck at the other end of the car, so that it was quite long, it resulted that if the chains were adjusted to apply both systems of brakes *on a straight track*, the short chain would prevent the car from running on a curve, and would, sometimes, hold the car so firmly as to throw it off the track on reaching a curved part of the railroad; and if they were adjusted *to a curve*, then the brakes could not be applied *on a straight track!*

Ephraim Harris, the inventor of this brake, has been examined as a witness in this case, and it will be instructive to refer to what he says about it.

At pages 86 and 87 of the Record, he testifies as follows:

> "*Q.* Was said brake in use on cars? if so, on what cars, for how long time, and how did it work? Explain fully."
>
> "*A.* Said brake was in use on cars for part of two years. *It did not give satisfaction in working.*"
>
> "We had two long crate cars running from Springfield to Albany; at Albany the road descended towards the river; this crate car then had a single brake on it, and running down to the river to unload the cars the brakeman undertook to brake up the car and the chain broke, and before he could get to the other end of the car to brake, the car ran into the river."
>
> "Mr. Gray, then superintendent of the Western Road, wanted I should put something on the car—an attachment put on the car—whereby the brakeman, if the chain broke, would have command of the other truck to brake it; and I arranged a car the same as this model, and on arranging it in this way, *we found considerable difficulty in winding the two chains on the windlass;* they would over ride, *and even so much as to destroy the power of the brake on the car entirely;* the first lever from the windlass was something like fourteen (14) inches; being that distance, if the chains were adjugted so as to brake both trucks at a time (I mean to apply on a straight track), the short chain would prevent the car from turning on a curve; these chains had to be altered, or lengthened, to accommodate the curves of the road."
>
> "The brakeman and conductor on the cars found considerable difficulty and fault in their operation."
>
> "The car had been thrown from the track in consequence of the short chain not allowing the truck to accomodate itself to the curves."
>
> "*This brake, at the time it was put on, was not intended to brake both ends of the car at once; it was put on in case the short chain broke, that the brakeman might have the use of the other.*"
>
> "The crate cars were switched from the main track, and were run down towards the river to unload their contents into the boat, and this attachment of the brake was put upon these cars to prevent them running into the river."
>
> "On the last car the brake was put on—the second car—I put a swivel joint on the long rods, for lengthening or shortening the same; that did not improve the brake at all."
>
> "*These brakes were in use part of two summers; the cars were then thrown aside for a while, and then rebuilt.*"
>
> "*The brakemen considered they could handle the car better* WITH THE SINGLE BRAKE."
>
> *Cross-examined:*
>
> "*Q.* You say the brakeman and conductor said they could handle the car better with the single brake; did they not, on this brake, have all the advantages of a single brake? If not, why not?"
>
> "*A.* They did not, on this brake, have all the advantages of a single brake; the windlass that takes the chain couldn't be but about a certain length from the platform down; consequently it gave a short distance for two chains, and this long chain being the upper chain, and the lower chain having to be put so low on the windlass, many times the lower chain would toggle under the bottom of the windlass; then, in other instances, the upper chain, having to have some considerable slack to accommodate the operation, at the first turn of the windlass the upper chain would ride down upon the lower chain—overlap on the lower chain."

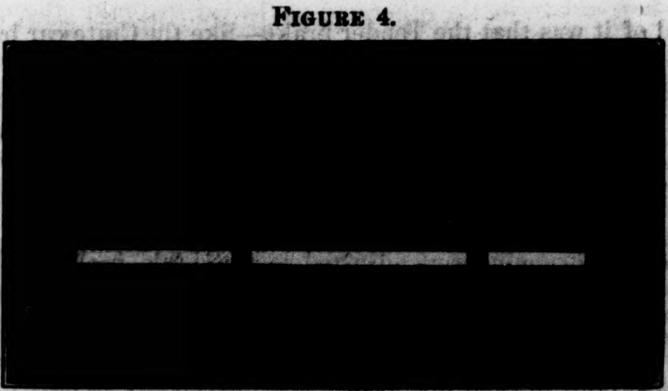
"*Re-direct:*"

"*Q.* When these cars were altered what kind of brake was pu; upon them?"

"*A.* A single brake; *this brake was abandoned and thrown out, and was never put on any other car while I was there*" (p. 88).

Previous to the form of Springfield brake thus disposed of by Harris, another one had been used on the same railroad on Tenders. A representation of this brake is given in Figure 4.

FIGURE 4.



The Springfield "Tender" Brake.

This device is even more specifically two single brakes connected together than the crate car brake was. In it the first rod r runs directly from the windlass to the brake lever of the first truck—just as in the original single brake shown in Figure 1—and the second rod r connects directly from that lever to the brake lever of the second truck.

Stress is laid by the defendants on the fact that this tender brake has continued in use. But there is nothing in this. It is not pretended by any of the witnesses that it has continued in use on anything except tenders. It could do so on them because, as will be seen in the picture, a tender is a short car—very short as compared with the long body of the modern eight wheel car—and consequently the defects of the brake do not on tenders produce such serious results, and also because the brakes on tenders are reqnired to be used but little.

If this tender brake is attempted to be employed on passenger cars, it at once discloses all the faults of the crate car brake and fails of success equally with that. This is because a passenger car is so much longer than a tender, and also because it requires to have its brakes used much oftener.

The case is not without positive proof to sustain this statement. About the year 1857—of course long after Batchelder and Thompson had successfully made their invention—the Western Railroad Company of Massachusetts, seeking to avoid liability for using the double brake, applied this tender brake to a large number of passenger cars belonging to the so-called "New York and Boston Express Line," and hence styled the "Line" cars.

These cars ran between New York and Boston, and the brake was kept on them for about eighteen months. How successful it was may be seen from the testimony of Hebron T. Douglass, a witness for the complainant and one of the master mechanics of repairs of the cars. He says:

> "The impression was general on the road that these brakes were not what they ought to be; they complained that they could not stop the trains.
>
> "*They used to run one car behind the train of cars which had the Springfield brakes on with a different brake on, for the reason that they did not consider it safe to run the cars alone with the Springfield brake.*" (*p.* 127).

The end of it was that the Tender brake—like the Crate car brake—was taken off these cars and the double brake put back in its place. And that is the last which has been heard of the Tender brake on passenger or "long" cars up to this hour. I believe it is not claimed on the other side that it worked well on these cars.

"The utter worthlessness of these Springfield brakes is well set forth in the testimony of Mr. Samuel Cooper, the highly intelligent expert who has been examined in this case by the complainant.

At page 107, he says:

> "This brake (the Springfield brake) would act successfully as a single acting brake, *but never as a double acting; if it were adjusted to operate on a straight track, it would not work upon a curve: and if adjusted for a curve, it would not operate upon a straight track.*"
>
> "The model itself shows this sufficiently; it would be fully as apparent upon an operating brake; and if the brakes were applied; for instance, upon a curve, or running upon a straight track, or upon a reversed curve, the chains would be liable to be broken or strained; but the chief objection to it is that it could not be adjusted both to straight tracks and curves."
>
> "*Int.* 10. If there was a swivel joint, or turn buckle, on the long rods to shorten or lengthen them, would that materially change your opinion of the brake?"
>
> "*A.* Not at all; it would enable you to adjust these rods but would not help the case on running from straight tracks to curve, or *vice versa.*"

And at page 112, he thus testifies:

> "*Int.* 26. Can the Springfield brake be so adjusted as to apply the brakes of both trucks at one and the same time *when the car is running on a straight track* and from either end of the car?"
>
> "*A.* I have not a doubt but that it can, and I have not a doubt but that if they were so applied, *and were to run upon a curve while they were so applied*—a thing which is done every day with car brakes—*the train would be exceedingly liable to jump the track* unless the chains were so light as to give way and by their breaking save the other catastrophe."
>
> "*Int.* 27. Please explain how such a catastrophe could take place as that of *throwing the train or the car from the track?*"
>
> "*A.* When the brakes were applied on the straight track the short chain to the adjacent lever was strained tight, dragging the truck as far round to one side as the flanges of the wheels would permit."

> "Now, if we run upon a curve which requires the truck to swivel in one direction, the brakes will be taken off by that motion perhaps at the moment when they are most required; *but if the curve turns in the other direction so as to swivel the trucks the other way, something must break or the car must go off the track, for the flanges are already hard up against the rail, and the truck, manifestly, can swivel no further so long as it remains on the rails.*"

It is entirely clear that a successful double brake is not to be sought by connecting together two single brakes.

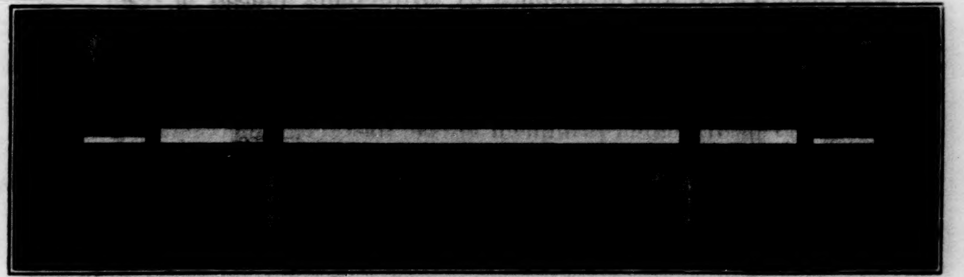
Other abortive efforts to invent a successful double brake appear in the case.

One of them was the "Millholland" brake.

Millholland was a practical railroad man, and at the time he got up his brake was Superintendent of Machinery on the Baltimore and Susquehanna Railroad.

A representation of this brake is given in Figure 5.

FIGURE 5.



The "Millholland" Brake.

The leading features of its construction were the "drum" arrangement D, underneath the car body, and the fixed points n, n, in the trucks—causing absolute rigidity throughout the system of connections of the brake levers, These two features together, as the testimony abundantly shows, made an abortion, mechanically—such a thing as was found by practical experience to be unable to be put to successful use upon railroads, and was therefore, as the proofs show, abandoned by the inventor himself and laid aside after one or two month's use. The reasons why it was unsuccessful are fully explained by Mr. Cooper, at page 107 of the Record. He testifies:

> "*Int.* 8. Please examine the model marked 'Millholland Model,' 'I, H.' and state what you find in the construction and arrangement of the brake shown in that model, if anything, that is calculated to prevent it from working practically and successfully when applied on railroad cars?"
>
> "*Ans.* There are two great defects in the brake shown by this model; first, the necessity of multiplying the power exerted by the man upon the windlass before it reaches the wheels is not here recognized; indeed, this power is divided up between the wheels, and is divided instead of being multiplied; the result would, doubtless, be that one man would exert an altogether insufficient force upon the brakes of a double

> truck car; the other objection is that there is no elasticity in the whole arrangement, all the pivots being rigid; if a single shoe were worn or lost all the force applied would be expended on a portion of the brakes, and, in my opinion, the brake could never be a practical one."
>
> "The drum in the centre is rigid and entirely unelastic; besides which, it has no effect to multiply the power transmitted from the windlass; but if this were the only defect it might be made to operate."
>
> "The chief defect, in my opinion, arises from the fact that the brake levers are also pivoted rigidly to the trucks; whereas in the Tanner brake they are suspended loosely from the truck, which gives an entire self-adjustability to the latter."
>
> "There are, in fact, in the Millholland, three entirely rigid points in the system of levers, *which, in my opinion, render the brake practically, and for any length of time, useless.*"

In the opinion of the Circuit Court this brake is fully considered, and the learned Judge says of it:

> "It is conceded—and the proof clearly shows—that it was never applied in any instance but upon one car, and I think it is clear that it was thrown aside and abandoned by Millholland himself in 1845."

In addition to the unsuccessful contrivances thus far mentioned as disclosed in the state of the art, the patent itself contains a disclaimer of two other brakes, one the "Griggs" brake and the other—though no name is given to it in the disclaimer—known to be the "Turner" bumper brake. But while the description in the disclaimer of each of these mechanisms is vague, it is apparent that they were merely "momentum" brakes—set in operation by the momentum of the moving train, and not actuated in any manner by means of windlasses. They were attempts to secure the application of brake shoes to all the wheels of a car, but not as *hand* brakes, and they are therefore outside the class of brake mechanisms to which the invention of Batchelder and Thompson belongs. It is not anywhere in the case pretended that they were successful, and no time need be spent on them. Enough has long been known of the requirements of a practical car brake to make it obvious that neither of them could answer the purpose.

The state of the art as Batchelder and Thompson found it has thus been presented. It is all which is disclosed by the testimony, and with a few immaterial exceptions, not of a character to enlarge it, all which existed. It is, so far as efforts at double-acting brakes are concerned, a record of failure. It demonstrates that the problem which Batchelder and Thompson undertook to work out was not an easy one. Practical railroad men—the projectors of the Springfield brakes, and Millholland, the foreman of railroad mechanics—had sought in vain to solve it, and Griggs, a veteran railroad expert and inventor, had deemed it wisest not to attempt to connect the brakes with the windlasses at all. By no one had a successful double-acting hand-brake been produced.

What Batchelder and Thompson Invented.

It has been seen that success was not to be found in connecting two single brakes together. A fundamental reorganization of the brake mechanisms known to the art was demanded.

FIRST—THE TRUCK BRAKE.

It will be remembered that the controlling defect of the old single brake and the two forms of the Springfield brake, was that the brake mechanism of the truck was wholly tied to the windlass, and that this organization of the parts was unaccompanied by any provision for enabling the brake connections to accommodate themselves to the swiveling of the trucks on curves. Batchelder and Thompson commenced, therefore, by modifying and reorganizing the single brake, and giving to it as thus modified a mode of operation different from what it had before, in order that it might be adapted to form a part of a double-acting mechanism.

To make more clear what they did in effecting this first step in their invention, the following Diagrams are presented.

DIAGRAM FIRST.

[redacted]

This diagram represents the arrangement of the old single brake, showing how all the brake connections of the truck—namely, the rod o, the lever L, and the rod and chain r—were tied to the windlass, with no provision for accommodation to curves.

DIAGRAM SECOND.

[redacted]

Diagram Second shows the manner in which Batchelder and Thompson modified this mechanism. That is to say, they first disconnected the rod r from the windlass and its chain, and then they turned the truck round, or reversed it, so that the brake rod r and lever L should be operated towards the centre of the car. In this way they formed their truck-brake. It was no longer the single brake because it was no longer connected with or operated by the windlass. To be the single brake, the truck connections must be attached to and be worked directly by the windlass. If it is otherwise, it is not the single brake. The direct connection to the windlass is as integral a part of the single brake as is the lever L or the rod o.

Having thus provided a truck-brake for each end of the car, which, by being freed from connection with the windlass, was adapted to conform to the curves of a railroad, the next step was to combine these independent truck-brakes with each other and then connect them with the windlasses.

SECOND—THE ADDITIONAL LEVER SYSTEM.

The object of the inventors was to produce a brake all the shoes of which could be applied simultaneously from either end of the car. Manifestly additional levers to those which formed part of the two truck-brakes must be introduced to accomplish this. Because the truck-brake levers—L and L′ in the diagrams—could do no more than work the brake shoes of their respective trucks against the wheels. When they had performed this function they had, so to speak, exhausted themselves. They had received power at one and applied it at the other of the only two points at which a *single* lever can do either. There could remain in neither of them any other operative points from which power or motion or a medium or connection could proceed either to the opposite truck-brake or to the windlasses. Thus, in Figure 6, L represents a lever such as is used for the truck lever of car-brakes and is seen in all the preceding figures, being in this example a lever of the second order, that is, one in which the weight or resistance is between the power and the fulcrum.

FIGURE 6.

Precisely such a lever as this is the lever of Batchelder and Thompson's truck-brake, and it is of course apparent that it has only three operative points, so to speak, that is, a power point, a fulcrum point, and a force point. To the power point must run the rod or rod and chain connection which works it, it must use the fulcrum point for the resistance without which it cannot work at all, and from the force point must extend the rod which connects it with the brake-bar at the opposite side of the truck. It can do nothing more for it is only *one* lever—a "*single*" lever.

There being at each end of the car—in the plan of the inventors—a truck-brake with such a lever in it, and the object being to connect these two independent truck-brakes with each other and with both the windlasses, it is clear that an additional lever or system of levers was needed to do it. If no further lever was used, the brake would be only the Springfield brake and would fail of success. But *two* additional levers, or a "double" lever—which is the equal and equivalent of two "single" levers—would combine both the truck-brakes together, and would connect them to both windlasses so that they could be operated from either end of the car.

Such a double lever—the equal of two additional single levers—Batchelder and Thompson introduced into their car, and the invention was complete. All the brake shoes could be simultaneously applied to the wheels from either end of the car; there was no tying of the two brake systems to the same windlass without provision for accommodation to curves—as in the Springfield brakes; and there was no system of rigid, fixed points throughout the mechanism—as in Millholland's contrivance. Freed by Batchelder and Thompson's invention from these defects, the brake at once became a practical success. It went into immediate use, and it has continued to be used up to the present hour.

The function of this double lever added by Batchelder and Thompson is important in more than one branch of this case. It may be denied that it *is* a double lever, and it will therefore be well to demonstrate here and now that it is.

This can be done at a glance by diagrams, and for the sake of showing it more clearly by contrasting a "single" lever with Batchelder and Thompson's lever, Figure 6 is here repeated.

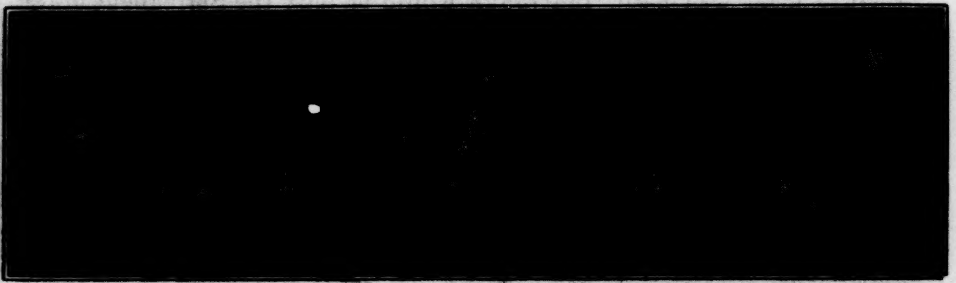
FIG. 6 Repeated.

FIG. 7.

A "single" lever, such as is represented in Figure 6 Repeated, has already been seen to have but three operative points—a power point, a fulcrum, and a force point. But Figure 7 is the Batchelder and Thompson lever—the double lever A′ of the patent—and it is obvious that it has *two* power points, *two* force points, and that its fulcrum is common to each half of it. In other words, it has double the number of operative points which a "single" lever has. It is therefore properly termed a "double" lever.

The next Figure—Figure 8—shows the mechanical relation of this added double lever to the already described truck brakes.

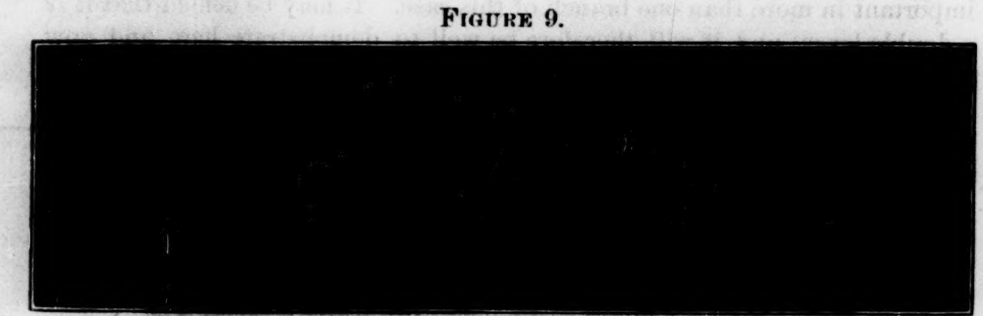
FIGURE 8.



The rods r and r′ have now only to be extended or produced out to the two points on the double lever A′ nearest to the centre or fulcrum and fastened there, and the chains of the windlasses W and W′ lengthened out by rods to the ends of the lever A′ and there secured, and the mechanism is complete.

Figure 9 shows these connections made.

FIGURE 9.



This form of the combination is that which is represented in the drawing of the patent.

It is thus apparent that the component parts of the invention, are, first, the truck brake, produced by modifying the old single brake and causing it to work towards the centre of the car; and, second, the double lever, or additional lever, to combine the two truck-brakes together and connect them both with both the windlasses.

The proper definition, therefore, of what Batchelder and Thompson invented—so far as respects their hand brake as shown in the patent—

is, that it was the combination of two truck-brakes—or, as may with equal accuracy be said, the two systems of brakes—arranged and operating as described, that is to say, disconnected from the windlasses and working towards the centre of the car, with each other and with the windlasses, by means of the additional lever system or double lever, in such manner that the brakes can be applied simultaneously to all the wheels from either end of the car.

This combination, at the date of their invention of it, was absolutely new in the art. The two leading elements of it, the truck-brakes disconnected from the windlasses and working to the additional levers, and the double lever system itself, were also entirely new elements in a car brake.

HISTORY OF THE MAKING AND TESTING OF THE INVENTION BY THE INVENTORS.

The testimony of the complainant's witnesses Asahel G. Batchelder, one of the inventors, and Albert J. Bellows, who assisted them in having the invention tested on the Fitchburg Railroad, respecting the matters which relate to this topic, is wholly uncontradicted. The appellants did not call a single witness on the subject. A synopsis of this testimony will therefore be a sufficiently satisfactory mode of putting the facts of this part of the case before the court.

Asahel G. Batchelder, pp. 92–99, testifies:

> That he became acquainted with L. F. Thompson, his co-inventor, in the Spring of 1846. That his attention was first called to the subject of railroad car brakes by Thompson showing him a model of a car brake. That soon after, they worked together of evenings, planning different kinds of brakes, and in October, 1846, they together invented and made drawings of a brake, from which he made a model during the following Winter, and finished it in January; it might be as late as February, 1847. That the model marked "Bachelder Model, E. Merwin, U. S. C." is the original model made at that time, and that the said model also had a bumper arrangement, not now on the model. That he made another model for the Patent Office in March or April, 1847, which was taken to Nathaniel Heath, at Boston, Mass., whom they employed as an agent to take out the patent, and who was to become interested in the patent. That they applied for a patent for it about the middle of June, 1847. That he and Dr. Bellows applied a brake on their plan on a car on the Fitchburg road, in Massachusetts, in October, 1847, and that it worked to their entire satisfaction. And that they applied another like it to a car on the Lowell road soon after. That it was put on at the expense of himself and Dr. Bellows, the companies merely doing the forging of the iron work. And that the construction of it for both roads was the same, and that the model marked "Fitchburg Model" represents the brake as it was put on the Fitchburg road.
>
> That the invention consisted of two parts, viz.: a brake to be worked by hand, and an arrangement by which it could be worked with the bumper by the inertia of the train.
>
> That their main object in the bumper arrangement was to apply the brakes to the front of a train by the hand arrangement, and thereby check the speed of the front car, so that the inertia of the rear cars would cause the bumpers to operate and apply the brakes to the wheels

> of the other cars, and thus stop the whole train. That both arrangements could be worked separately. That the witness considered the hand arrangement the most important, and that they intended that the patent should secure both arrangements, and so instructed their agent. That Heath made the application for the patent as their agent. That he was to pay the expenses of procuring the patent for an interest in the invention, and that he assured them that the patent would be granted in about six months.

This evidence clearly establishes the fact that the invention was made as early as October, 1846, at which time it was fully represented by drawings from which the complete model Exhibit "Bachelder Model" was made no later than the first of February, 1847, and was reduced to practice by being applied to a car on the Fitchburg road in the Fall of 1847.

Batchelder's testimony is corroborated by the witness Bellows, who says:

> That he first became acquainted with the double-acting brake invented by Bachelder and Thompson, by Thompson showing the model Exhibit "Bachelder Model," or one like it, either in the latter part of 1846 or in the first part of 1847. That some time after this he engaged to assist them in making a practical application of it to a car on the Fitchburg Railroad. That he became possessed of one-quarter interest in the invention on condition of defraying the expense of testing it; and that it was applied to the car on the Fitchburg road as represented in the model marked "Fitchburg Model." (pp. 89, 90).

This witness fixes the time of his first seeing the model of this brake by the fact that it was the Winter preceding the time of his writing a letter to a gentleman in the Fall of 1847, which letter related to the application of the brake on the Fitchburg road, which had then just been made. This letter he says was afterwards found in the records of the Patent Office. (p. 90.)

As the appellants introduced no testimony whatever to contradict these witnesses, the fact that the invention was completed in October, 1846, must be taken as indisputable in the case. Discussion of the appellants' efforts to show that prior to that time it had been made by others, does not come within the design of this Brief, as that portion of the argument will be made by my associate. I will therefore proceed with the topic under consideration.

It has already been seen by the testimony of Batchelder, that the model which is marked "Bachelder Model," and which was completed by the inventors as early as the first of February, 1847, was made by them from, and was like, the drawings which they finished in October, 1846. This model is before the court, and it shows that the form of the invention embodied in it is precisely the form which is described and represented in the patent.

In this model, as in the patent, the rods which form the connections between the windlasses at each end of the car and the centre double lever, and between this lever and the brake levers of the two trucks, operate by pulling.

Batchelder also states, (p. 93), that they tried the brake on a car on the Fitchburg Railroad in the Fall of the same year, 1847, and that it worked to their entire satisfaction. He says the model marked "Fitchburg Model" represents the precise arrangement as it was put on the Fitchburg car, and by referring to this model it will be seen that it represents identically the same arrangement as is shown in the patent. When either of the windlasses is turned it pulls the centre double lever by one of the two rods, and the centre lever in turn pulls the levers of the two trucks by the other two connecting rods.

But there is on this model, in addition to the arrangement above described, some others necessary to be understood. At each end of each car there is a sliding bar called a bumper and draw bar. These are the usual bars by which the cars are connected in a train, and which coming into contact are forced inwards by the inertia when the speed of the locomotive, or of the head car, is checked. The inner ends of these bumpers, when so forced inwards, strike against the truck levers of the brakes, and it follows that as soon as both of the bumpers are forced inwards all the brakes would be operated simultaneously to apply friction to the eight wheels; but when this operation is performed it is by the *pushing* of the truck levers by the bumpers, and each bumper operates the brakes of the truck with which it is connected. This method of working the truck levers by the bumpers is made able to effect its purpose because the connecting rods which run from the centre double lever to the truck levers, are sufficiently light and flexible to bend when the bumpers are moved inwards, and therefore the centre lever will not be operated by them.

There is still another arrangement on this model with which, by means of small side levers at each end of the car, the brakeman can push the upper ends of the truck levers laterally, so that they shall not be acted upon by the bumpers when backing the train. When so set, the whole mechanism is in a condition for operating all the brakes simultaneously by turning the windlass at either end of the car, and by the windlasses only—in which case all the rods operate by pulling.

From this it follows that the invention as reduced to practice on the Fitchburg Railroad, consisted of two inventions:

First—The invention precisely as it is described in the patent, consisting of the combination of the brakes of the two trucks by a central double lever and two rods, and the connection of the central lever by means of two other rods with the windlasses at both ends of the car, so that the turning of either windlass would apply all the brakes simultaneously, all the connecting rods acting by tensile force, that is, by pulling.

Second—An arrangement of bumpers which could be so set as to operate all the brakes by the inertia of the cars, leaving them free, however, to be operated by the hand windlasses; or the said truck levers could be so set that the bumpers would not act upon the brakes at all.

Batchelder further testifies that the next Summer after the test on the Fitchburg Road—that is, the Summer of 1848—they put the brake as it is shown in the "Fitchburg Model," including the bumper arrangement, on a car on the Lowell Railroad, at Lowell, (p. 93). This, therefore, constituted a second practical test of the hand-braking part of the invention in the same form in which it is represented in the patent.

It is thus apparent that the inventors used due diligence in perfecting their invention and reducing it to practice.

The patent was applied for on the 26th of June, 1847, and was granted on the 6th of July, 1852. During all this interval the inventors were doing all that, situated as the testimony proves they were, they could do to obtain it. And as the uncontradicted evidence is that the identity and continuity was unbroken between the form of the invention as it is represented in the patent, and that in which it was first embodied in the drawings made in October, 1846, and in which it was tested in the trials on the Fitchburg and Lowell Railroads, and as the proofs show clearly that the failure to obtain the patent until 1852 was wholly caused by delays in the Patent Office, and by the incompetence of Heath, the agent with whom they had contracted to apply for and secure the patent, it is submitted that under the established rules of law no forfeiture of their rights took place on account of the lapse of time from 1847 to 1852.

But this subject of legal forfeiture or abandonment in the aspect in which it is presented by the appellants, will be argued by my associate, and I shall therefore pass to what may be termed its *mechanical* aspect.

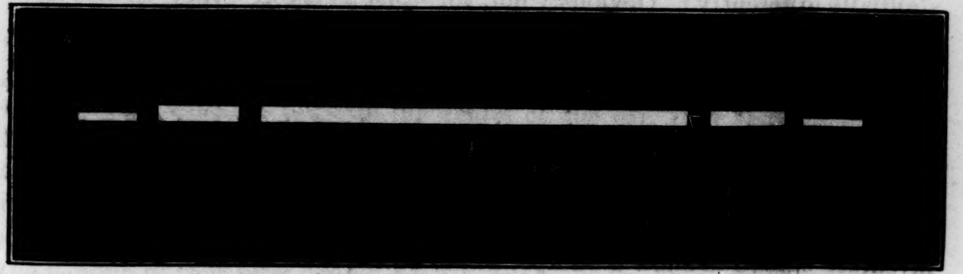
Substantial Identity of the June, 1847, Patent Office Application, and the Patent as granted.

Batchelder testifies, p. 93, that in March or April, 1847, he made another model—for the Patent Office—and carried it to Boston and left it with Heath, whom they had employed to take out the patent. This model he says, p. 94, Heath carried to the Patent Office, and he states that it was like the model which is in evidence marked "B. and T.'s P. O. Model, E. M."

The original application for the patent in June, 1847, described and represented the mode of application of the invention shown in this model sent to the Patent Office, instead of the mode of application shown in the first model made in January or February, 1847, and reduced to practice on the Fitchburg and Lowell Railroads. Between these two modes there are slight differences, and they are these:

First—The brake lever of each truck is not disconnected from the windlass, but notwithstanding this, the mode by which its connection with the windlass is applied causes the truck to be virtually turned round, as in the January, 1847 model, and in the patent, while the truck lever works towards the centre of the car, precisely as in that model and in the patent. This slight difference in arrangement will be readily understood from Figure 10.

FIGURE 10.



It will be seen that the connections J J from the windlasses to the truck levers LL pass around the shieves SS before being attached to the levers. But the variation due to this is of the most trifling consequence. It produces, so far as the operation of the truck lever is concerned, substantially the same result as if the lever was wholly disconnected from the windlass as it is in the January, 1847, model and in the patent. The object of disconnecting the lever is to free it from the inflexible attachment to the car body which destroyed the efficiency of the Springfield brake and the single brake, and enable it to accommodate itself readily to the swiveling of the truck. This same result the shieve arrangement accomplishes also, because the connections J J are flexible, as they must be to pass around the shieves, and as the truck lever is placed between the windlass and the shieve, the flexible connection must first be carried beyond it in order to be passed around the shieve and then be brought back to it, and this causes the connection to form a sort of *loop*, as seen in the Figure, before its extremity is attached to the lever. This provision enables the top of the lever to vibrate readily, or "float," as it is sometimes termed, to accommodate itself to every movement of the truck in swiveling. It is simply a slightly different way of doing the same thing that the inventors had in view in the January, 1847, model and in the patent when they disconnected the truck levers from the windlasses, while retaining the same underlying idea and causing the truck-brake to operate on precisely the same principle, because it is left *perfectly free to yield to the swiveling of the truck*, and *because it works towards the centre of the car*.

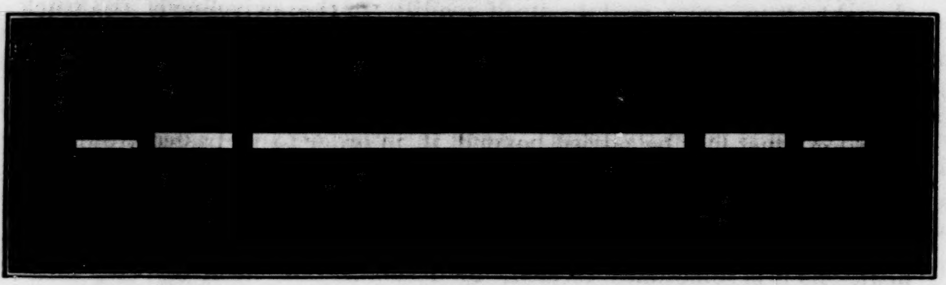
Second—Although the truck-brakes are combined by means of a central lever and rods so that they shall work together and in unison, these rods operate not by a pulling force but by pushing. This will be obvious on examination of Figure 10. But can this make any difference? The expert, Cooper, says that "the substitution of parts having a tensile strain for others having a thrust motion would be the simplest proposition that could be proposed to a mechanic." (p. 109). And it is apparent that it is so. Suppose the rods which in the January, 1847, model, and in the patent, run from the centre lever to the truck levers, were made to push, could it be seriously pretended that they had thereby become different rod and operated substantially differently? Obviously not, for—just as before—they would, with the centre lever, combine the two truck-brakes with each other and would enable them both to be operated simultaneously from either windlass in almost identically the same way. It is manifest this would not be a material difference, and for the same reason the push rods of the Patent Office model of June, 1847, are not materially different from the pull rods of the inventors' first model and of the patent.

The only reason push rods were put in the Patent Office model was that the inventors wished to show a bumper brake on the same model. That class of brake always was designed to operate by pushing, and therefore the means of actuating the centre lever when the truck levers it was connected with were pressed inwards by the bumpers, were shown as push rods.

But take the bumper brake out of the model. The necessity for push rods vanishes, and nothing is easier than by slipping the flexible connections out of the shieves and carrying them to the centre lever, to instantly convert the push rods into pull rods.

In Figure 11 this is done.

FIGURE 11.



Does it require invention to do this? Is it not almost a necessary consequence of taking away the bumper brake that anybody would do it? And will this court say that Batchelder and Thompson, who had already done it in their first model in January, 1847, could not do it in the new model filed when the patent was granted, without materially varying from this model in which they had done the full equivalent of it?

It is believed that this part of the case will appear entirely clear, and that in comparing the Patent Office model with the inventors' other models, much confusion will be avoided if the hand-brake portion of it is looked at away from the bumper brake. For that reason, only the hand-brake is shown in Figures 10 and 11.

All that need be said of the fact that in this Patent Office model the connection of the centre lever with the windlasses instead of being made directly by a rod extending from each windlass to it, is made indirectly through the shieves and brake levers of the trucks, is that it is wholly immaterial whether this connection be direct or indirect, so long as it enables the centre lever to be actuated from the windlasses. What possible difference can it make *how* this is done, so long as it *is* done? Because when it is done, since the lever is by rods directly combined with both the truck-brakes, it causes the shoes to be applied to all the wheels simultaneously, whichever windlass is turned. That is the object of the invention, whether in one model or another. All the models—the Patent Office model as well as the others—show the truck-brakes working towards the centre of the car, they show them combined with each other by means of the centre lever, and they show the centre lever moved, and moving both truck-brakes, whenever either windlass is turned. Those are the material things, and if they are found, can it make any difference *how* the turning of the windlass moved the centre lever, or how the moving of that lever actuated the truck-brakes?

CONSTRUCTION OF THE PATENT.

But little need be said on this subject. The claim of the patent is as follows :

"What is claimed by us is to so combine the brakes of the two trucks with the operative windlasses or their equivalents, at both ends of the car, by means of the vibrating lever A′, or its equivalent, or mechanism essentially as specified, as to enable the brakeman, by operating either of the windlasses, to simultaneously apply the brakes of both trucks or bring or force them against their respective wheels, and whether he be at the forward or rear end of the car."

This claim is perfectly plain. As in this case we are dealing only with eight-wheel—that is double-truck—cars, I have in this brief, for the sake of conciseness, used the term *truck-brakes* for the expression in the claim, "brakes of the two trucks." It has already been shown that one of the component parts of Batchelder and Thompson's invention was their truck-brake, formed by modifying the single brake and causing it to work towards the centre of the car; that another was their additional lever arrangement, and that the form of this represented and described in the patent is the central lever A′.

The claim is for a combination, and it is submitted that it is clear from the language of it—taking into view the state of the art and what it has been seen that Batchelder and Thompson actually invented—that the elements of that combination are—

First—The windlasses at both ends of the car.

Second—The truck-brakes as heretofore explained and defined.

Third—The added double lever arrangement as heretofore described—represented in the patent as "the vibrating lever A′, or its equivalent."

Fourth—Connections between the windlasses and this added lever arrangement adapted to actuate the latter when either windlass is turned.

Fifth—Connections between the added lever arrangement and the two truck-brakes adapted to actuate them when the added lever arrangement is moved.

The legal meaning, therefore, of the claim is, that it is for the combination of the windlasses at the ends of the car with the described truck-brakes, by means of the described added lever arrangement and connections between the windlasses and it and between it and the truck-brakes, in such a manner that a brakeman by turning either of the windlasses can apply the brake shoes to all the wheels of the car simultaneously, the whole operating substantially as described.

The claim thus construed is simple and clear, and is commensurate—but no more than commensurate—with what these inventors actually did.

This interpretation of it, tested by what has been shown was the condition of the art when they entered the field, gives to them the precise invention they made. No less, but no more. If it be correct, we shall have but little trouble with the subject next to be considered, which is the last which this Brief will discuss.

INFRINGEMENT.

The brake by the use of which it is claimed that the appellants infringed the patent is known as the "Stevens" brake. It was invented about the year 1851, and was designed by its projector to carry the art of car-braking a step beyond Batchelder and Thompson's mechanism. Whether in actual use it really does this to any appreciable extent, is a question which is abundantly discussed in the proofs taken upon the accounting before the Master in this case. But, at all events, it is unquestionable that over and above what Batchelder and Thompson invented, the Stevens device contains a patentable special combination of parts. It was made the subject of a patent in November, 1851, and the patent and drawing in full will be found at page 76 of the Record. It will not be contended on this argument that that patent is not valid for what Stevens did and what it claims. But it is submitted that it is entirely immaterial whether Stevens devised an improvement in double-acting car brakes, so that, as a result, he made a better brake of that class than was known before. For it is at any rate evident that his brake is double-acting, and it is believed to be capable of demonstration that the means which it employs to simultaneously apply the brakes to all the wheels of the car, from either windlass, contains and uses the combination of Batchelder and Thompson.

The position, therefore, which will be here taken is:

First—That the Stevens brake contains the modified truck-brakes of Batchelder and Thompson, and also the precise equivalent of their added lever system.

Second—That it combines these elements with the windlasses in substantially the same way.

Third—That this combination in it operates in substantially the same way for precisely the same purpose.

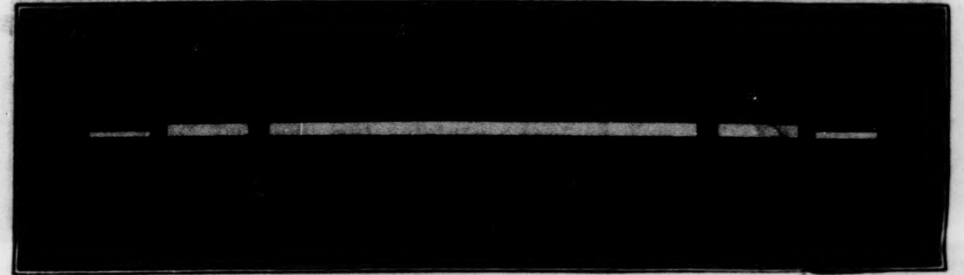
The easiest and shortest way to establish these propositions will be to resort again to Diagrams.

But first it is to be noted that two forms of the Stevens brake are referred to in the Stevens patent. One of these—the one shown, at page 75, in the drawing of that patent—is generally termed the Direct form of the Stevens brake ; the other is termed the Indirect. It is this indirect form of the brake which is represented in the models in the case as being that which was used by the defendants. It is seen in Figure 12.

Figure 12.

The term "direct" merely signifies that the direct Stevens brake is based on the form of truck-brake derived from the direct form of the old single brake, as seen in Figures 1 and 2 at page 6 of this Brief. That, as has been shown, was an early form of the single brake on eight-wheel cars. But in process of time, the evils incident to the inflexible attachment of the truck lever of that brake to the windlass which have been fully described heretofore, came to be recognized as so serious that an attempt was made to ameliorate them somewhat by placing the truck lever at the end of the truck *farthest* from the windlass, so that by lengthening its connection to the latter more freedom might be given to it to yield to the swiveling of the truck on curves. This only partially diminished the difficulty, but still it was some improvement, and it was considerably used until double brakes superseded the single brake. A representation of it applied to an eight-wheel car is given in Figure 13.

Figure 12.



Old Single Brake--Indirect Form.

The form of the Batchelder and Thompson brake shown in the Tanner patent is that which is based on the direct form of truck-brake.

But not long after the introduction of double brakes, they too—the Batchelder and Thompson as well as the Stevens—came to be generally used with the *indirect* truck-brake, that is to say, the truck-brake derived from the above represented indirect single brake. Hence the indirect Stevens brake is that form of it which is based on the indirect truck-brake.

As has been stated, the models show this indirect form as the brake which was used by the defendants.

ANALYSIS OF THE BATCHELDER AND THOMPSON OR TANNER BRAKE IN ITS INDIRECT FORM, TO SHOW THAT THE STEVENS INDIRECT FORM CONTAINS AND USES IT.

First—The Stevens indirect form, that is to say, the defendants' brake, contains and is based on Batchelder and Thompson's truck-brake, and uses it turned round, and working towards, or substantially towards, the centre of the car, as they do.

This will be apparent from the Diagrams.

DIAGRAM FIFTH.

This Diagram represents, in outline, the indirect single brake before being modified in accordance with Batchelder and Thompson's invention to make their truck-brake. It is seen that the levers L and L′ are not yet disconnected from the windlasses, and the trucks are not turned round.

DIAGRAM SIXTH.

We now have Batchelder and Thompson's truck-brake. The windlass connections r and r′ of the single brake are disconnected, the trucks are turned round, and the levers L and L′, and the connections, work towards the centre of the car. To complete the Batchelder and Thompson invention, their added lever system would next be introduced, and when located as shown in the patent, would be placed in the centre of the car, the truck-brake connections r and r′ would be extended out to the proper points on it, and rods would be carried from the windlasses to the extremities of it.

In Diagram Seventh we see the truck-brake of the defendants' mechanism —the indirect Stevens brake. It is apparent that it is precisely the same as the Batchelder and Thompson indirect truck-brake of Diagram Sixth.

DIAGRAM SEVENTH.

Its windlass connections r and r′ are disconnected, *the trucks are turned round*, and the levers L and L′ are *adapted to work towards the centre of the car.*

Here is no "modification of the single brake," which is original with and was first made by Stevens, as is insisted on the other side. It is the *modification of the single brake* which Batchelder and Thompson first made, taken bodily from them—arranged precisely as they arranged it and operating in substantially the same way.

It is specially to be noted that Stevens did not enter the field until about 1851, five years after Batchelder and Thompson had made their invention, and had put into it this very truck-brake mechanism. Their invention therefore was—as to Stevens—a part of the state of the art by which his later claims to originality must be controlled and limited. He needed to use, for the foundation of his brake, such a truck-brake mechanism as is seen in Diagrams Sixth and Seventh. He found it ready to his hand in the prior invention of Batchelder and Thompson and he took it bodily from them. It therefore follows in common sense and in law that his brake is bottomed on theirs and not on the single brake.

Second—The defendants' brake contains, and cannot be used without, Batchelder and Thompson's added lever system, or at all events the substantial equivalent therefor.

It is of course obvious that the Stevens indirect mechanism has levers in it additional to those which formed part of the truck-brakes as he took the latter from Batchelder and Thompson's car. They are the levers marked a and a′ in Figure 12 on page 27 of this Brief, to which the court is asked to turn back. They are not only additional levers, but they are connected with the windlasses by rod and chain connections—one to one windlass and the other to the other—so that they are actuated by the windlasses when either of the latter is turned. They also are the means by which the two truck-brakes are united with each other and made to work in unison, and—since the levers themselves are connected with the windlasses—by which these truck-brakes are combined with the windlasses. They are two "single" levers—the equivalent of Batchelder and Thompson's double lever, and for the same purpose.

It is true they are not put in the same place as the Batchelder and Thompson added lever system is. But can that make any difference? They are in fact the Batchelder and Thompson added double lever, cut in two in the middle at the common fulcrum of its two halves, and, together with the windlass connections of that lever, merely carried back to the trucks and set up there, at a and a′. They are located at a different place in the mechanism, but they are the same things in substance, and they do the same work. The change in their location has, it is true, caused the two truck-brakes to be combined together and when so combined to be connected with the windlasses, by an indirect train of rod and lever mechanism—namely, the rods o and o′, the original levers L and L′ of the truck-brakes, and the windlass rods and chains r and r′, instead of by the direct mechanism in Batchelder and Thompson's invention of the rods G^2 and H^2, and their connections. But since they perform the same work, would it not be trifling with the subject to say that to do indirectly what Batchelder and Thompson do directly, is a substantial difference?

The change in their location is what would be naturally expected from the object which Stevens sought to accomplish. His brake was designed to be simply an improvement upon Batchelder and Thompson's structure, and it aimed to add to the latter the advantage of the well known mechanical principle of the lever, that if equal power is desired to be applied at two points at the same time—as at the two brake-bars of the truck—two equal levers, a, L, and a′, L′, (Figure 12), must be employed between those points. This was his object. He retained Batchelder and Thompson's added levers, but he changed their location and effected his object.

The special combination of parts by which he did this is what he invented, and what his patent claims, and for that it is unquestionably valid.

Third—The mode of combination and of operation in the defendants' brake is the same as in Batchelder and Thompson's invention.

The test of this is to note that by the Stevens added levers a and a′ and their rod connections, the two truck-brakes are united into one system so that the shoes may be applied simultaneously to all the wheels, and the system so combined is connected with both the windlasses, to be actuated indifferently by either of them. It is apparent that this is the method of combination, and the identical mode of operation, of Batchelder and Thompson's brake.

The defendants have called no witness to prove that their brake does not infringe the patent. But the complainant's witnesses, Bond and Cooper, pp. 78, 117, testify that in their judgment it does; and the testimony of the latter, whom the Circuit Judge, in his opinion, calls "a very clear-headed man," is full and strong upon the subject, and the court is respectfully referred to it.

The truth is, the plea that they have not infringed, is an after-thought of the defendants. They abandoned it in the court below until so late that they thereby admitted they had no confidence in it. They took no testimony about it. The first opinion of the Circuit Court, p. 66, explicitly says: "No question has been made in relation to the infringement. It is denied in the answer, but it is not insisted on or pressed in the argument."

Stress is laid upon it in this court, but it is believed that the view taken of it in the brief filed for the appellants is radically erroneous, because it is inconsistent with the state of the art and with the mechanical facts which must govern this case.

It seems clear that these facts compel a decision of this issue for the complainant.

Respectfully submitted,

S. D. COZZENS,

Of Counsel.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1878.

THE CHICAGO AND NORTHWESTERN
RAILWAY CO., Appellant,
vs.
THOMAS SAYLES, Appellee.
No. 48.

APPELLEE'S BRIEF
ON
VALIDITY AND ACCOUNTING.

STATEMENT OF THE CASE.

The appellant's "statement of the case" being controverted by the appellee, the latter avails himself of the rule in that regard, by re-stating it.

The original application for the patent, on which this suit is founded, and which was filed in the Patent Office June 26, 1847, was *not* "for a 'train' or 'bumper' brake, operated by the cars crowding on each other when the train slackens its speed."

On the contrary, it appears, upon an inspection of the model and drawings accompanying that application, (the latter of which is reproduced on page 136 of the record, and the former of which is before the court, both in a sworn and in a certified copy,) that the application was for a *combined bumper and hand brake.* It will also appear that the *hand* portions have no necessary connection with the *bumper* parts, and constitute, by themselves, a hand brake, identical in substance and almost identical in form with the brake as patented. It is true, the bumper parts were never used to any great extent; but the *hand* portion proved on trial to be a great and important step in the progress of railroad invention, and has been for many years, and still is, very widely used in the United States.

Moreover, the invention was originally made in October, 1846, in the *exact form* in which it was patented.

In April, 1852, the inventors amended their application for a patent, by omitting therefrom all reference to the bumper portions of the model of June, 1847, and confining their claim to the hand portions thereof, and representing the latter by specifications, drawings, and a model identical in every particular with the hand brake in its original form.

No successful double brake was ever invented or used prior to our invention, though some unsuccessful and abandoned experiments were made in that direction.

This suit was begun in 1861, and passed to an interlocutory decree in 1865. The accounting had progressed a considerable time when, in 1867, the defendant secured an opening of the case, to let in alleged newly-discovered evidence, which, if true, would invalidate the patent for want of novelty. When this issue came to be argued, in 1869, the defendant insisted, *for the first time*, that it did not infringe our patent, even if it was valid. (See opinion of 1865, p. 66, line 19; and opinion of 1871, p. 69, line 43.) This afterthought was a surprise to us, inasmuch as it first appeared in the eighth year of the litigation, and at a time when nothing but a discussion of the alleged want of novelty was in order.

A second interlocutory decree was entered in 1871, and the master's report confirmed by a final decree in 1873. In 1874, that decree was sought to be set aside by the defendant; but the application was refused in 1875, and the final decree amended by the court as to the amount only. Thereupon the defendant appealed to this court, where, after being on the docket three years, the case is now reached for consideration.

It is not proper to say, as the appellant's counsel does, that "If this decree is correct, there is hardly a road that has not infringed this patent"; for the simple reason, that more than *one hundred railroad companies* many years ago purchased licenses to use it, at the low rates the appellee and his assignor were always willing to receive from those disposed to purchase rather than pirate their property.

Neither does counsel hit the mark, when he says "Most of the defendants in these suits have bought and paid for the Hodge and Stevens brakes, on the belief that they are independent inventions, and no infringement." Both those brakes were held to be infringements, in a hotly-contested jury trial, as early as 1854, (p. 25,) and no court or jury has ever, since or before, held the contrary. Infringers do not seem, therefore, to be entitled to much sympathy on account of their "belief," even if it had been generally held by them, of which there is not a word of proof in the record, and which the appellee wishes explicitly to deny.

QUESTIONS IN THE CASE.

1. ALLEGED ABANDONMENT.
2. ALLEGED FRAUD.
3. NOVELTY.
    - A. MILLHOLLAND BRAKE.
    - B. STANLEY-TALSON BRAKE.
    - C. NICHOLS BRAKE.
    - D. JOHN TYLER CAR. (CAMDEN AND AMBOY ROAD.)
4. INFRINGEMENT.
5. ACCOUNTING.
    - A. Is it the infringer's saving, or the patentee's license fee, that is the proper measure of the profits recoverable in this case?
    - B. Was it the single brake, or the Springfield brake, that the master should have adopted as the standard of comparison, when proceeding, as he did, to assess profits under the rule in Mowry *v.* Whitney?
    - C. How much did the defendant save on brakemen's wages, by means of the use of our invention, during the time sued upon?
    - D. How much did it save on wheels?

This brief summarizes the appellee's argument on all of these questions, save that of INFRINGEMENT. That subject, being discussed in the printed and oral arguments of Mr. S. D. Cozzens, needs not to be presented here.

BRIEF OF THE ARGUMENT.

ALLEGED ABANDONMENT.

The statement in this behalf in the respondent's answer is: "That before the issue of said letters-patent, said Thompson and Bachelder had abandoned their said pretended invention to the public."

No abandonment *prior* to the application for the letters-patent can be charged; but it is insisted by the appellant that an abandonment occurred *after* the application, and before the letters-patent were granted.

Such an abandonment was, till 1861, a purely hypothetical one in our law, inasmuch as it had never been contemplated by any statute till then. Indeed, it has never yet been found to exist in any adjudicated case. The courts have, however, recognized the *possibility* of an abandonment of this kind, and have stated the grounds out of which it must arise in order to occur.

"The law does not favor an abandonment, and throws upon the party who seeks to obtain the benefit of a forfeiture, the burden of *proving* it *beyond a reasonable doubt.*"

Nelson, J., in McCormick *v.* Seymour, 2 Blatch., 256 (1851).

"By the application filed in the Patent Office, the inventor makes a full disclosure of his invention, and gives public notice of his claim for a patent. It is *conclusive* evidence that the inventor did not intend to abandon it to the public. The delays *afterward* interposed, either by the *mistakes of the public officers*, or the delays of the courts, where *gross* laches cannot be imputed to the applicant, cannot affect his rights."

Grier, J., in Adams *v.* Jones, 1 Fisher, 530 (1859).

"It is not possible to hold that any use of the invention without the consent of the inventor, while his application for a patent is pending in the Patent Office, can affect the operation of the letters-patent after they are duly granted."

Clifford, J., in Dental Vulcanite Co. *v.* Witherbee, 3 Fisher, 98 (1866).

"The inventors ought not to be held responsible for the errors of others which they could not prevent."

Swayne, J., in Blandy *v.* Griffith, 3 Fisher, 618 (1869).

"Such a defense [as abandonment after application] cannot be sustained, unless the *acts* of the party, invoked for the purpose, are *corroborated* by some *declaration* manifesting such an intention."

Clifford, J., in Jones *v.* Sewell, 6 Fisher, 366 (1873).

Such being the *law* of the matter, the record discloses the following as being the *facts* in this case:

June 26, 1847. Full application was made by the inventors for letters-patent. See File-Wrapper of Application Papers, page 141.

December, 1847. Bachelder and Thompson wrote Heath, their agent, to "stay proceedings," as "they thought they ought to make some alteration in the model they sent to the Patent Office."

Bachelder's deposition, bottom of page 93.

It appears (p. 138) that Heath did accordingly write to the Patent Office December 9, 1847. It is, however, proven by the testimony of Cooper, the Patent Office examiner, (p. 124, q. 3,) that no action was had on the letter, and that the Patent Office paid no attention to that or to the subsequent letters of inquiry (the first of which doubtless contermanded the letter of December 9) which Bachelder says (p. 94, par. 5) Heath wrote at his and Thompson's frequent solicitation. The appellant objects that these last letters are not proved according to the rules of evidence. If It desires to throw them out of the case on that ground, then the letter of December 9, must go with them; for the certificate which covers it is no proof of its genuineness, or that Heath ever actually wrote such a letter at all. It *may*, indeed, have been a forgery, surreptitiously introduced among the papers in the case, years after it purports to have been written, and for the express purpose of helping to defeat our patent.

June 26, 1847, *to October* 9, 1850. It is proven (Cooper's deposition, p. 124, q. 3) that during this entire time the invention and the inventors were entirely ignored by the Patent Office officials.

It is not incumbent upon us to show the *reason* of this apparently strange delay, but we will, nevertheless, point it out. Cooper, the examiner, says (p. 124, q. 2) that "at all times, applications for patents are liable to be overlooked and delayed, until inquired for by the applicants or their agents."

It appears from the File-Wrapper and its contents that Heath filed no power of attorney, or other evidence of authority to act as agent for the inventors, until October 4, 1850; so that the Patent Office had no knowledge whatever that he had power to do anything for them, and therefore ignored all his letters. Not being urgently reminded of the existence of the application by any duly authorized party, the Patent Office ignored it, while giving attention to later applications, which were "engineered" through by persistent and skillful agents.

The *law*, however, does not contemplate it to be necessary for applicants to be continually "button-holing" the Patent Office officials, and urging them to do their duty. Heath's letters urging the Office to proceed were natural enough, but they were wholly unnecessary in the eye of the law.

On the contrary, the application being duly placed on file in the Patent Office, the *next* duty devolved on its officers, which duty was to examine the application, and either grant the letters-patent or notify the applicants why they could not do so; and if their inability arose out of defective or insufficient specifications, also to give them such information and references as might be useful in judging of the propriety of altering the same.

Patent Act of 1836, sec. 7.

Neither of these duties, however, had been performed before October, 1850.

See File-Wrapper, pp. 141, 142.

Early in that month Heath wrote again to the Office, fortifying himself for the first time with evidence of his authority to act, in the shape of a formal assignment from the inventors. (p. 138.) Thus stimulated, the Patent Office for the *first time* paid any attention whatever to the case, by returning the papers to Heath's agent, Eddy.

October, 1850, *to October*, 1851. During this period Mr. Eddy reviewed the papers and returned them to the Office, and after waiting several months for the latter to act, and again urgently writing it for its decision, succeeded, in October, 1851, in receiving a letter, in which the officers of the Patent Office informed the inventors for the *first time* that the drawings and specifications were insufficient; (p. 139;) but even *then* they gave no information as to how they might be *corrected*, as it was their duty under the statute to have done.

July 6, 1852. In less than nine months after the Patent Office did even a *part* of its preliminary duty in regard to the case, amended specifications and drawings, and a model to correspond exactly therewith, were furnished by Mr. Eddy, and filed in the Office; and the letters-patent were obtained by him for Mr. Tanner, who, in April, 1852, had purchased the invention from Bachelder and Thompson.

The truth, therefore, is, that the inventors applied for their patent in June, 1847, and, without any fault on *their* part, were unable to get the Patent Office to examine the case till October, 1851, and within nine months after they received the first information that the application papers were insufficient, proper amendments thereto were made, and the letters-patent obtained.

It is not true that Heath became sole owner of the invention in April, 1847, as the counsel for the appellant asserts. The real relations of Bachelder and Thompson with Heath, Bellowes, Eddy, and Tanner were as follows: Bachelder and Thompson, being poor at the time of their invention, and therefore unable to pay a patent solicitor in *money*, (Bellowes' deposition, p. 89, line 23, and Bachelder's, p. 95, line 8,) *agreed* to give Heath *one-third* of the patent for obtaining it. (p. 94, line 52.) Late in 1847, Bellowes was admitted, by joint agreement of Bachelder and Thompson and Heath, *which agreement* provided that Heath and Bellowes were each to have one-fourth of the *proceeds* of the patent; (p. 95, line 10;)

the consideration for this agreement being, that Heath was to "do the business in regard to obtaining the patent," (Bellowes deposition, p. 89, line 21,) and Bellowes was to be at the expense of trying the brake on the railroads. (p. 95, line 14.)

After the six months from date of the application, at the end of which time Bachelder and Thompson had been informed that they might expect to receive the letters-patent, (p. 94, line 30,) they frequently—*i. e.*, after December 27, 1847—applied to Heath for an explanation of their disappointment in not receiving it. (p. 94, line 32.) He replied, assuring them that he was doing all he could to get the letters-patent, by writing the Patent Office, which is the only method of "button-holing" that can be practiced by non-resident solicitors. This went on for a considerable time, but at last Bachelder and Thompson grew restless under the delay, and plainly told Heath that if he could not secure the patent they would rescind their agreement with him, and secure the services of somebody who could. (p. 94, line 6 from the bottom.) Heath, thinking he had a good thing, did not want to lose it, and therefore endeavored to placate them.

Thereupon they insisted that if he wanted to continue his relations to the invention, he must employ Mr. Eddy, a well-known patent solicitor. Heath objected on two grounds: 1. He was on ill terms with Eddy (p. 94, line 16 from bottom); 2. Eddy's charges were high. (p. 95, line 4.) Their urgency, however, finally prevailed, and Heath finally consented to employ Eddy "some." (p. 95, line 9.)

It seems that even after Heath employed Eddy "some," in order to placate the urgent inventors, the two former gentlemen did not pull well together, for Eddy made no change in the application papers, but returned them to the Patent Office in July, 1851, for consideration there. Bachelder and Thompson were now getting very impatient, and *themselves* soon after went to Eddy, to see if something could not be done to get the officials in the Patent Office to recognize the existence of the application which had been filed there more than four years before, and about which, during the last three years and a half, they had written, through Heath, for information, but *never* could get any reply. (p. 139, par. 3.)

Accordingly, Eddy wrote the letter of September 10, 1851, at the close of which occurs this language,—the language of two long-neglected and impatient inventors:

"They now *respectfully* request that their application may be *examined*, and the result reported to me."

That is the very thing the Patent Office, according to the law, ought to have done, *without* all this "punching up." At last, however, as we have seen, that Patent Office did *one-half its duty* in October, 1851; but instead of conforming to the law as to the other half, they departed from it, by saying, that because the specifications and drawings were insufficient, "the Office, from what it can learn of the case, cannot encourage you, however, to press the application further."

Notwithstanding this very discouraging letter, Bachelder and Thompson were still determined to pursue their application. (p. 97, q. 16.)

We ask the court to bear in mind that these inventors put forth all this diligence before they ever heard or knew of Henry Tanner.

Henry Tanner was the owner of the *Turner* patent for a double brake which had been invented by a clergyman of Buffalo, New York, named Turner, in 1848, and which was so different from the Bachelder and Thompson invention, that if it had been useful, it was doubtless patentable, notwithstanding the latter. It had a center lever operating from either end of the car; but instead of *one* lever in each truck, it had *eight*, the idea being to have a lever on each side of all the four wheels. Henry Tanner, however, soon after he bought the patent of Turner, in 1849, was genius enough to see that the eight levers were wholly impracticable; and he accordingly had a model made, for the purpose of exhibiting the valuable part of the invention, with the center lever and one lever in each truck, and hitting upon the exact form of brake that had been invented by Bachelder and Thompson in 1846. (p. 539, re-direct q. 2, 3.)

Some time in 1851 Tanner went to Hartford, Connecticut, with this model, for the purpose of introducing it there, (p. 540, x-q. 3,) and found to his surprise that Nichols, the master mechanic on the railroad, had already made the same thing, (p. 541, x-q. 12,) having done so, as we shall hereafter see, in 1848, about the time Turner made *his* invention.

In the winter of 1851–52 Tanner sought to surrender and reissue the Turner patent, so as to confine it to the combination experience had taught him was the practicable one; but though Turner was entitled to a patent for his original combination, the reissue could not be granted as desired, simply because Bachelder and Thompson had invented precisely the same thing, as the Patent Office had abundant reason to know from the frequency with which its attention had been called to it by Heath and Eddy. It accordingly so informed Tanner.

Tanner had been the first man in the United States to travel extensively among railroads and introduce double brakes. He saw at once that his occupation would be gone the moment Bachelder and Thompson obtained letters-patent, unless he could obtain an interest therein. Accordingly, he visited them, and secured from them the assignment of the *legal title*, printed on page 70 of the record. The one hundred dollars mentioned therein was a merely nominal consideration, which more properly would have been written *one* dollar. The *real* consideration is proven by Bachelder (p. 97) to have been as follows:

> "Int. 18. What consideration did Mr. Tanner offer for your application, and what consideration did you accept?
>
> "A. He offered to pay us one-half he collected, after deducting twenty-five per cent. from the whole sum collected for collecting, and we accepted that offer. For all expenses, and lawsuits also, he was to be reimbursed from the general fund."

This history, deduced wholly from the record, shows conclusively that it cannot be claimed by the appellant that the inventors were themselves guilty of any neglect; but it is claimed that their *agents*, Heath and Eddy, were lacking in diligence, and that "The neglect of their agents is the same as their own." On this point, however, the appellant labors under the disadvantage of disagreeing with Mr. Justice Swayne, who held, in Birdsell *v.* McDonald, 6 Pat. Off. Gaz., 682, (1874,) that the inventor is not chargeable with the neglect of his agent in such cases. What Heath *really* lacked, however, was *not* diligence, but *experience* and *skill.*

That it is the policy of the law to give inventors ample time in which to perfect their application, is exemplified by the Patent Act of March 2, 1861, which provided, in effect, that abandonment of an application shall be held to have occurred only when the specifications and drawings shall not be filed within two years after the petition, or when the applicant fails to prosecute his case within two years after *action by the Office*, of which he has been *notified;* and not even *then*, if the delay is shown, to the satisfaction of *Commissioner*, to have been unavoidable.

Moreover. Bachelder and Thompson showed conclusively that they never intended to abandon their application, inasmuch as, notwithstanding their poverty, they did not apply for the return to them of the portion of the application fee to which, in the event of such abandonment, they would, under section 7 of the Act of 1836, have been entitled.

This court held, in the case of Smith v. The Goodyear Dental Vulcanite Company, 93 U. S., 500, (1876,) that Dr. Cummings did not abandon *his* invention, though he was unable for *eight years* to prosecute it further, after the unfavorable action of the Patent Office upon it in 1856.

In the case at bar, it was only a little over *eight months* after the *first* action of the Office that the application was not only prosecuted, but prosecuted to a successful issue. Under these circumstances, this court will doubtless coincide in the opinion his honor Judge Drummond gave in the case, which was, that "The whole testimony shows that they [the inventors] had *not* abandoned what they considered to be an improvement, to which they had a right under the law. Certainly they cannot be held responsible for delays in the Patent Office, and the law, by its terms, provides for the perfection of imperfect and insufficient specifications even after the patent issues."

See opinion of 1865, p. 63, last paragraph.

ALLEGED FRAUD.

Under this head, the answer of the appellant states "That said letters-patent were obtained wrongfully and fraudulently by the said Tanner." And it is claimed by the counsel, in his brief, that the fraud consisted in Tanner's obtaining the letters-patent in 1852 for a different invention from the one embodied in the model, specification, and drawings accompanying the application of June, 1847.

This allegation would be sufficiently met by citing the cases in which this court has held that a patent of the United States can be attacked on account of fraud in its issue, only by means of a direct proceeding to repeal it, and never collaterally. Some of those cases are Rubber Company *v.* Goodyear, 9 Wall., 798 (1869); Eureka Company *v.* Bailey Company, 11 Wall., 492 (1870); Seymour *v.* Osborne, 11 Wall., 543 (1870); Mowry *v.* Whitney, 14 Wall., 439 (1872).

In the last of these cases, it was also held that a proper direct proceeding of the kind will be as effectual to declare an expired patent null *ab initio* as to repeal a patent still in force, and even if this were not so, the appellant could not complain; for the answer in this case, setting up the alleged fraud, was filed more than eleven years before the patent as extended expired, and when more than four years of its *first* term still remained in which to secure its repeal, if any ground existed therefor.

Fraud will not be *presumed*, but must be proved; and all the more so, because if it occurred the Patent Office participated therein, inasmuch as Tanner could not have *obtained* a patent based on an old application for a different invention without the Patent Office having *granted* it, and, equally with the receiver, being guilty of the cheat.

The appellant, indeed, never had faith enough in its own charge of fraud to take any testimony to prove it.

The appellee, however, did introduce evidence to *negative* the charge, by proving the substantial identity of the invention patented, with the *hand* part of that upon which the application of June, 1847, was based, consisting of:

First. That of an eminent expert, whom his honor Judge Drummond complimented very highly in his opinion of 1865, (p. 66, line 4,) but of whom the counsel for the appellant speaks as "one Cooper, who is *made* to swear." This gentleman, in judging of whose qualifications this court will be governed, on the one hand, by the inherent strength and clearness of his testimony, together with Judge Drummond's opinion, or, on the other, by the poor opinion of Mr. Payson, is fully questioned and cross-questioned on this subject. He says (p. 106, a. 6): "The invention claimed in the Tanner Patent referred to, is embodied in the Patent Office model originally deposited with the Bachelder and Thompson application. It is also represented in the drawings, and described and distinctly claimed in the original application. The specifications evidently were not drawn by an adept; neither were the drawings made by an artist; but there is sufficient to show that the invention then claimed was the same as that now claimed in the patent, notwithstanding the dissimilarity of language in the two documents. * * * * *In the drawings, we find a particular description of all the parts which go to make up this hand operation of the brakes which is claimed in the* Tanner Patent. The cross lever in the center of the car is lettered D. The connections between this lever and the brake levers are lettered A. * * * * In the specification, I find as follows: The letters *A*, C, *D*, H, and I are the parts which we claim as our improvements. It is customary to put the claim at the end of the specification; but it is very common, with persons not acquainted with the method of soliciting patents in this country, to put their claims anywhere in the body of the specification. This is not allowed in our Patent Office, but it is in England. There is another claim, at the close of the specification, the purport of which is rather obscure, but I notice, that while the parts referring to the hand operations are lettered and described, those parts which refer to the application of the brakes by the backing of the engine are neither lettered nor particularly described, but are simply referred to. It would not seem, therefore, that even the claim at the end of the specification could be intended to refer to the application of the brakes by the bumper."

And on cross-examination Mr. Cooper says (p. 109, x-q. 3):

"So far as concerns the operation of the brake, I have no doubt that it could be so applied [*i. e.*, so applied and operated as to be an acceptable brake to railroad managers]. I might suggest mere mechanical changes of arrangement; but there is a wide difference between such changes and the changes which involve invention and the introduction of new principles of action. I should prefer to operate the center lever by pulling instead of pushing it; but that is a mere mechanical change, which every mechanic understands."

Second. A comparison of the Patent Office model of 1847 with the one of 1852, which latter is an exact representation of the brake as patented, will show the court that there is no substantial difference between the two, and that the *apparent* difference arises almost wholly out of the fact that the model of 1847 contained, in addition to the *hand* brake, a "bumper" arrangement, having no necessary connection therewith, and which has nothing to do with the case at bar.

In making such comparison, it is proper, therefore, to ignore, in the model of 1847, the butters and the rod H—the butters being intended to collide with the two truck levers, and the rod H being designed to liberate the truck levers from the butters, when it was desired to back the train.

The "bumper" portion being thus eliminated, the court will see that the model of 1847 is identical with that of 1852, save that in the former each windlass is connected by means of a chain to one part of the mechanism, viz., the top of one truck lever; while in the other it is connected by means of a chain and tensile rod to *another* point, viz., to one end of the center lever; the direction of the movement of every part being the same in both models. There are also two other very slight formal differences, to wit: In the model of 1852 the truck levers are placed nearest the inner brake bar in each truck, while in that of 1847 they are placed nearest the outer brake bar; and in the model of 1847 the rods connect the center lever to the truck levers at the ends of the former, while in that of 1852 they are connected to it a little nearer its fulcrum. These differences are, however, the merest matters of form. Every identical part of the combination in the model of 1852 is in the model of 1847, save that in one case chains are used to transmit tensile strain, and in the other, chains and rods are united for that purpose.

Appellant's Argument Answered.

The learned counsel says:

First. "It [the center lever in the model of 1847] does not receive the power from the windlass and transmit it to the brake levers, but receives it from one lever and transmits it to another."

He himself elsewhere shows that this is of no importance; for he construes our claim on page 67 of his brief, and prints his construction in capital letters. His formula there is, "Combining the two sets of *brakes and windlasses*, by means of the vibrating lever A^1, or its equivalant, so as to apply all the brakes at once from either end [of the car]." On page 68, line 6, he intimates we *might* perhaps have had a broader claim; and in line 16 calls this claim "precise and definite."

A glance at the two models will show that the center lever combines the "two sets of brakes and windlasses" just as truly in one as in the other. The counsel himself says, at the bottom of page 16 of his brief, that the claim printed on page 542 of the record, and which he says, on page 17, line 4 of his brief, was adopted in the Tanner patent with "some slight verbal changes," is in terms fitted equally well to what he calls the Bachelder and Thompson brake, (the model of June, 1847,) and the Tanner brake. The counsel, therefore, has himself killed his first, and indeed his whole attack on the identity of the two models, by saying that a claim which he characterizes, at line 16 of page 68 of his argument, as "precise and definite," "*is in terms fitted equally well to either.*" A precise and definite claim could hardly be *in terms* fitted *equally well* to two machines substantially different from each other, as the learned counsel insists these two models are, but which we have shown they are not.

The learned counsel says:

Second. "One of the rods of the model of June, 1847, is a pull and the other a push rod alternately; and the consequence is, both have to be made very thick and heavy to stand the thrust."

Even if this consequence were true, one naturally inquires, "What of it?" Cooper, however, shows (p. 110, q. 10) that only half the power exerted by the brakeman is transmitted through the rod, and (p. 109, q. 7) that it is an entire mistake to suppose that a very strong bar would be required for the purpose.

The learned counsel says:

Third. "This center lever [that in the model of June, 1847] does not increase the power of the windlass." When hard pushed to make out another part of his case, he says (p. 23, line 17): "But no one would think of claiming that it was any less the Tanner lever on that account,"—thus again assassinating on one page the argument he strenuously makes on another.

The learned counsel astonishes us by saying, (p. 13, line 21,) "We have thus four connecting rods [in the Tanner] instead of two, [in the model of 1847,] and no two of them answering to the two connecting rods in the latter." We ask the court to notice that the two rods connecting the truck levers to the center lever in the model of 1847 do answer exactly to those that connect the same parts in the model of 1852, except that the latter join the center lever somewhat nearer its fulcrum, which, as we have seen, the counsel himself says is immaterial.

The learned counsel says in another place, (p. 14,) that the language used by the penner of the original specification, to include the windlasses and the chains that connect them to the brake system, refers to the only part of the whole contrivance that gives any color to the claim that the brake was ever intended for a hand brake, and italicizes the dreadful remark, that "It is not claimed as any part of the improvement."

The *reason* they were not so claimed, was doubtless because they were not *new*, being found in the same place in the single brake. The draughtsman of the specification was evidently under the pardonable though erroneous impression, that, when drawing a claim to cover a combination of old and new ingredients, he could claim *only* the new ingredients as used to combine the old, and could not claim *all* the ingredients *as combined.*

The learned counsel also says, (p. 14, line 6,) "Where the specification says that the brake may be applied by hand at pleasure without reversing the engine, it does not mean that it is to be used as a hand brake, but simply that this is another way of applying the bumper brake without reversing the engine."

To this complexion does he come at last!

A statement that a brake may be applied by hand at pleasure, don't mean that it is a hand brake! !

Mark his reasons: "The hand brake is applied on the foremost car, *thus slackening its pace*, and the other cars crowd on it and on each other, and thus the bumper brake is applied throughout the whole train." Did it not have to operate as a *hand brake only*, in order to slacken the pace of the foremost car? Moreover, suppose there is only one car on the train, as sometimes happens: then, if the engine is not reversed the bumper would not act at all, and the application of the brake "by hand at pleasure" would be the only *possible* application of the brake.

Against these arguments thus founded, interspersed as they are by worn-out and baseless innuendoes, and by unsworn statements quite foreign to the record, we interpose the opinion of his honor Judge Drummond, which may be found on page 63, beginning in line 12 from the bottom. His honor says: "A question connected with this, is whether, when the application was made, in June, 1847, there was substantially the improvement, the right to which was sought to be given to them by letters-patent in 1852; and I think there was. It is true, there was a change in the specification as perfected and as originally filed, *more* having been claimed in the original specifications. Still, I think it is *clear* that they claimed, in their original specifications, substantially the method of combining the brakes in the manner in which they set the claim forth in the last specifications upon which the patent issued."

The learned counsel for the appellant endeavors, in the space between IV on page 18 and II on page 22 of his argument, to show that the Scriptures are wrong in saying, "The [uncontradicted] testimony of two witnesses is true." Bachelder (p. 93) and Bellowes (p. 89) testified that the models before the court—known as the Bachelder model and the Fitchburg model—accurately represented the brake as invented in 1846, and as applied to a car on the Fitchburg Road in 1847, respectively.

There is not a particle of evidence in the record to contradict them in that regard; but the appellant complains because we did not corroborate them by four other people, namely: Thompson, who has been dead many years, having lost his life while serving in the army of the country that sought to reward him as an inventor; Heath, who for many years has lived in California, and who could have been reached at the time this testimony was taken only by a long overland or ocean journey; and Eddy and Tanner, who could have no possible knowledge on the subject except hearsay.

NOVELTY.

THE MILLHOLLAND BRAKE.

It is urged, by the appellant, that our patent is void for want of novelty, by reason of the use in Maryland, by one James Millholland, of the same machine, on one car, a year or more before our invention was made.

A model representing that brake is before the court; and we admit that one such drum brake was made, and attempted to be used, prior to our invention.

We deny, however, that it was the same as the Tanner, and insist that the attempted use was not a successful one, and that its entire history constitutes nothing but one of those *unsuccessful experiments abandoned*, with which the path of invention is always strewed. There are in the case only three short depositions pertaining to the matter on behalf of the appellant, and eight on behalf of our patent.

There is discord between some of those depositions, with regard to the *length* of time Millholland's brake was on the car to which it was attached; but, taking the entire testimony together, the facts are clearly shown to be as follows, concerning

Its History.

First. In April, 1845, Mr. Millholland first put his brake on one passenger car of the Baltimore and Susquehanna Railroad.

Mr. Millholland says "he thinks" it was put on "about" 1843; and Smith says he is not positive, but thinks the time was about 1843; while Leahy, the other one of the appellant's witnesses, says "the impression on his mind is that it was put on in 1843." Neither of the three, however, adduces any circumstances to corroborate his recollection.

On the other hand, Woods, one of the appellee's witnesses, says (p. 83) that it was applied in April, 1845, soon after he ceased to be a fireman and took charge of a stationary engine, located about 100 yards from the shop where he saw the drum brake being put on. He says that he took charge of this stationary engine April 1, 1845; and Hollins, who kept the pay-rolls, corroborates him in this particular.

Francis also says (p. 79) that he was a brakeman on the passenger train for the nine months prior to April, 1845, when he was changed to the freight train, and that the drum brake was not put on till after he went on the freight train. Hollins shows that this event took place early in April, 1845.

Yakel also says (p. 85) that when he began to work on the road as brake man on the passenger train, in April, 1845, (which, he says, was his first employment on any railroad,) the single brake was used on all the passenger and baggage cars, but that the drum brake was put on one passenger car a short time thereafter; and Hollins shows (p. 84) that Yakel began work April 9, 1845.

Elder says (p. 80) that he painted the drum brake when it was newly put on the car, and before it was used, and that he did so shortly after he succeeded Mr. Benson as foreman of the paint shop, which event, Hollins shows from the pay-rolls, took place April 11, 1845.

Denmead, who was foreman of machinery under Millholland, also says (p. 80) that the drum brake was put on in 1845, and that he remembers that Yakel was a brakeman on the train, on one of the cars of which the drum brake was used.

Our *five* witnesses, all of whom agree, and all of whom are corroborated by circumstances and by dates which were recorded in the pay-rolls of the company, must of course outweigh on this point the *three* witnesses of the appellant, none of whom either speak positively or are corroborated in any way. Accordingly, Judge Drummond, in his opinion of 1865, says that he thinks it appears satisfactorily that Millholland's brake was not used until 1845.

Second. In June, 1845, Mr. Millholland ordered his brake taken off the car to which he had applied it less than two months before, putting back the single treadle brake in its place, and never attempting to do anything more with the drum brake.

Wood says (p. 83) that the car with the drum brake was taken into the shop about the 1st of June, 1845, and the drum brake was taken off; and when he saw the car come out again it had on the old single treadle brake. Denmead says (p. 80) that the car on which the drum brake was put was repaired some short time afterward, and the drum brake taken off by Millholland's orders, and the single treadle brake put on in its place, and the drum brake not put on the car after it was repaired.

Yakel says also (p. 86) that he recollects distinctly that the drum brake was not put on the car after she was rebuilt.

Smith, the appellant's own witness, says (p. 164) the car was taken into the shop to be rebuilt in June, 1845, and that it is his impression the drum brake was removed from the car at that time.

Third. The drum brake was proved, during the short time it was tried on the car, to be an entire failure.

Yakel says (p. 85) he was the only brakeman employed on the train in which the drum-brake car ran, except the baggageman, who merely attended to the brake on his own car; that the car with the drum brake ran for a short time, about two days out of three, only 30 miles out of Baltimore in the morning and back again in the afternoon; that the drum brake worked very badly as compared to the single treadle brake; that he could not stop the train with the drum brake, though in trying to do so he several times applied it so hard as to break the chains; that he complained of these facts to Millholland and Denmead, and that consequently the car was left in the shed, unused for a time and then rebuilt, and the drum brake taken off and the single treadle brake put on in its place.

Woods says (p. 83) he recollects seeing the drum-brake car standing on the track in front of the shop a good share of the time; that it was not used generally, and that the engineer and brakeman complained that the drum brake was inefficient, and did not answer the purpose for which it was intended.

Denmead also (p. 81) fully corroborates Yakel, in saying that there were frequent complaints about the brake's inefficiency made to Millholland, Smith, and himself; and adds, that the trial of the drum brake proved a failure, and was abandoned.

Neither Francis, Elder, nor Hollins was in a position to know how well or otherwise the drum brake actually worked, and therefore say nothing on that point.

Fisher, the engineer, (pp. 91, 92,) however, fully corroborates Yakel, the brakeman, as to the worthlessness of the drum brake; and adds, that the reason the car was generally left at Parkton, 30 miles from Baltimore, instead of being hauled the 70 miles the train ran, was because they did not consider the brake safe to go over the summit with.

Millholland is the only witness who says he never heard any complaint about the working of the drum brake; but in view of the fact that he ordered it taken off after a short trial, and that Yakel swears he did make complaint to Millholland, and that Denmead says *he* knows the brakeman (Yakel) complained to Millholland about its inefficiency, Mr. Millholland's opinion, that he never heard any complaint, is thoroughly negatived.

Its Character.

It is a strange mistake of the law to say, as the counsel for the appellant, does, that "Millholland might certainly have obtained a patent for his brake."

He could *not* have obtained a patent, or if he could it would not have been *valid*, because his machine was not "useful" in the sense in which that word is used in the Constitution and the statutes, and as construed by the courts.

So far from being what the courts say a machine *must* be, to be useful in the sense of the Patent Law,—*i. e.*, "capable of successful operation,"—the short attempted use of the Millholland brake showed that it was wholly *incapable* of such operation. Millholland himself was of that opinion; for he abandoned it, and two years afterward told Leahy (p. 167, line 26) to keep a certain car in the shop till he could devise a double-acting brake,—thus showing conclusively that he thought the drum brake incapable of successful operation.

Our statement, that the Millholland brake was not even theoretically like the Tanner, will be seen to be true the moment it is remembered that, according to the learned counsel's own construction, (p. 67 of his brief,) ours is a patent for "Combining *the two sets of brakes* and *windlasses* by means of *the vibrating lever* A^1, or its equivalent, so as to apply all the brakes from either end [of the car]." Now, what does the counsel mean by "two sets of brakes"?

He himself defines the expression (p. 77, line 8 of his brief) to mean "the old single brake"; so that according to *the counsel's own showing* ours is a patent for a *combination* of three classes of ingredients, viz.: 1. The old single brakes; 2. The windlasses; 3. The vibrating lever A^1, or its equivalent.

He admits, what we will shortly explain, viz., that Millholland did not have the first of those classes of ingredients at all,—but had instead thereof a peculiar system of his own in the trucks, wholly unlike the "old single brake," and indeed unlike anything that anybody except Millholland ever thought of introducing into a car brake.

We say that the truck system of Millholland is not the equivalent of the truck system of the single brake, which is the first ingredient of *our* combination, because it is wholly lacking in the self-adjustability of the latter. If one pair of brake shoes in the latter become more worn than the other, the system at once adjusts itself to the changed condition,--a thing the Millholland truck system is wholly incapable of doing; and, what is still more important, the play in the journals always results in the rear pair of wheels of each truck falling back *from* the pivot of the truck lever, and the forward pair falling back *toward* that pivot, so that when the shoes are brought hard in contact with the rear pair they are at least one-eighth of an inch away from the forward pair, and therefore are as useless as though they were not on the car at all. This condition of affairs is reversed when the direction in which the car is run is reversed, because the wheels that before were the forward ones now become the rear ones in each truck. The self-adjustability of our truck system wholly obviates the evils that in the Millholland truck system constantly arise from either or both of these causes.

It is true, that Millholland *might* have combined the first element of our combination (viz., the old single brakes) with the *second* element, (viz., the windlass,) by means of his drum, if he had been gifted with sufficient inventive power. He, however, did nothing of the kind. The learned counsel, however, says "we" (he?) can do it now! In other words, he says, "It is true the Millholland brake did not anticipate the Tanner patent, which is a patent for a combination; but if the court will give me time I will get up one that will."

Furthermore, it is an entire mistake to assume, as the counsel for the appellant does, that the drum of Millholland performs all the functions, and is therefore the equivalent of our lever A^1. While speaking of and explaining away to *his* satisfaction certain differences that he apprehends we *might* point out between them, he says nothing whatever of a very substantial difference we *do* wish to call attention to, and which would be fatal to the practical utility of a brake even like the one in the learned counsel's chart, which he denominates "The Millholland Brake Slightly [?] Modified," and which figure 12 represents a purely imaginary structure, and one never before heard of in this case.

The fault we now speak of, is the constant liability of one or the other of the chains to "kink" or to "spiral" when the other chain does not, in either of which events all the power applied by the brakeman would pass to the truck connected by the kinking or spiraling chain, and, when *there*, pass to the rear brake bar in that truck, on account of the peculiar nature of the system in the truck, which we have explained.

That this kinking and spiraling takes place on a shaft, (a drum is only a large shaft,) and that it must produce the effect we assign to it, is very obvious, and, moreover, is sworn to by a number of witnesses, none of whom are contradicted. (See Hitchcock, p. 1080, x-q. 29–33.)

The counsel for the appellant says, (p. 71 of his brief, line 25,) "In the Tanner brake, the power is first communicated from the windlass, by means of its rod and chain, to one end of the lever A^1. There the power is divided, [by the lever,] *part* being sent back to the brake lever in the nearest truck, and the *rest* sent forward to the brake lever in the farther truck." Now, whenever one of the chains that connect the Millholland drum with the brake levers happens either to kink or spiral, this function, which the learned counsel says the Tanner center lever performs, cannot be performed by the drum. On the contrary, in all such cases, which are liable to happen at any time, the power transmitted from the windless to the drum is not and can not be divided between the two trucks at all. The drum is, therefore, *not* the equivalent of the center lever, because, though it may *happen* sometimes to perform the functions of the latter, it cannot be *relied* upon to do so at *any particular time.*

The conclusion of the whole matter, therefore, is, that the learned counsel asks this court to invalidate our patent, (which he says in effect covers a combination of three classes of ingredients,) on the ground that James Millholland *failed* to accomplish the same *result* we *did* accomplish by *another* combination of three classes of ingredients, of which only one class (the cranks handled by the brakemen) were the equivalents of the corresponding class (the windlasses) in ours. When arguing *validity*, he sets up this prior machine, because it was designed to accomplish our *result*, no matter how different the *means*, or how useless the machine. When discussing *infringement*, he substantially ignores the *result*, and then becomes a stickler for the necessity of finding identity of *means*.

We have thus far explained the *history* and the *character* of the Millholland brake. We will close the subject by quoting

Its Law.

"The settled rule of law is, that whoever first perfects a machine is entitled to a patent, and is the real inventor, although others may have previously had the idea and made some experiments toward putting it in practice. He is the inventor, and is entitled to the patent, who first brought the machine to perfection, *and made it capable of useful operation.*"

Agawam Co. *v.* Jordan, 7 Wall., 583 (1868).

"He is the first inventor, and entitled to a patent, who, being an original discoverer, has first perfected and adapted the invention to actual use."

Whitely *v.* Swayne, 7 Wall., 685 (1868).

"The invention relied upon as a defense must have been complete, and capable of producing the result to be accomplished; and this must be *shown* by the defendant. The burden of proof rests upon him, and every reasonable doubt should be resolved against him. If the thing were embryotic or inchoate; if it rested on speculation or experiment; if the process pursued for its development had failed to reach the point of consummation, it cannot avail to defeat a patent founded upon an invention which was completed, while in the other case there was only progress, however near that progress may have approximated to the end in view. If the question relates to a machine, the conception must have been clothed in substantial forms which demonstrate at once its *practical* efficiency and utility. Until the work *is done*, the inventor has given nothing to the public."

Coffin *v.* Ogden, 18 Wall., 124 (1873).

THE STANLEY-TALSON BRAKE

Under this heading, the appellant claims that our patent is void for want of novelty, by reason of a brake which the counsel says was applied on the New Jersey Railroad in 1842, and which he says was used only a short time and then abandoned. The counsel says it had *one* of the three classes of ingredients in our combination, viz., the center lever, but that the arrangement in the trucks seems to have been *somewhat* different. As to the nature and extent of that difference he gives the court no light. In fact, not a word further is said about the *facts* of the case, except to quote some language which the counsel *asserts* one of the witnesses *swore* Talson had at some period *told* him, touching the reason Talson *assigned* for the brake *not operating successfully*; and some other language which counsel *asserts* another witness used in giving his *views* on the same subject. Upon which of the 1174 pages of the record this language is to be found, the counsel gives us no hint, and a more diligent search by the writer than the importance of the matter required has failed to disclose. On the contrary, the erudite counsel plunges at once into the law books, determined to draw from thence *jurisprudence* enough to defeat our patent, for want of novelty, *without* any facts.

It seems, therefore, that if the matter is to be understood, the counsel for the appellee will have to explain it, which he will how essay to do.

Joseph F. Talson was superintendent of the car department of the New Jersey Railroad from 1836 to 1849. (p. 303, q. 2.) In 1853, when the action at law of Henry Tanner *v.* The Hudson River Railroad Co. for the infringement of our patent was about to be tried, Mr. George Gifford, Thomas M. North, John H. Reynolds, and Wm. Wheeler Hubbell, of counsel for the defendant, (Gifford's deposition, p. 521, q. 5; North's deposition, p. 494, q. 5,) were engaged in ransacking the United States, and especially the State of New Jersey, for evidence with which to defeat the patent for want of novelty. (p. 545, q. 3; p. 522, q. 12; p. 543, q. 5.) Among the people they discovered was Joseph F. Talson, and him they carefully interrogated, with the conclusion that he knew of no sound defense to the patent; (Gifford's deposition, p. 523, q. 15;) and they therefore advised the defendant to purchase a license, which it did.

The next year, however, (1854,) Mr. Gifford was retained to defend the New York and Erie Railroad Co. against our patent, in a case that went to trial in October. Here he put Mr. Talson on the stand for what he was worth, and Samuel Blatchford—now Circuit Judge, but then counsel for the patent—took and preserved copious notes of his testimony.

The italicized statement of the appellant's counsel, (p. 61, line 27,) that some of these four lawyers for the defendant—*i. e.*, Gifford, Reynolds, North or Hubbell —"are now retained by the patentees," is one that the honorable counsel, in justice to those gentlemen, ought never to have made. (See Gifford's deposition, p. 524, re-direct q. 1.) "Were you ever retained in favor of the Tanner patent by Mr. Sayles, the complainant in this case?" A. "I was not."

It is believed that the honorable gentleman knows very well that Mr. Sayles has no counsel whatever, except the writer of the present brief; Mr. Cozzens merely asking permission to be heard, without retainer, on account of interests he represents in the extended term of the patent, and any other lawyers in Mr. Sayles' employ being merely local attorneys of record.

The statement the honorable counsel found courage to insert in his own handwriting in the margin of page 61 of his brief, to the effect that his Erie suit was settled for $75, is refuted from the record itself. On turning to his reference on page 635, it will be seen that the $75 was the *verdict of the jury* for the technical damage *proved* to have been *already* committed, the patent then having been granted only two years and three months.

On turning to page 25 of the record, a letter will be found from the attorneys of the defendant, stating that, after the end of the suit, "The defendants thereupon paid in full the judgment which was entered on said verdict for damages and costs, and *also* paid for and took a license under said patent for the residue of its term, *and* paid for *past* infringements not covered by said verdict." The same facts were known to Mr. Sayles, and he swore to them in his bill (p. 8, line 33) in this case, and they were not denied in the answer, and not controverted in the evidence.

The bill in this case, filed in 1861, had attached to it as an exhibit, the plea for the defendant in the Erie case, including the notices of special matter attached thereto, the fourth of which will be seen (p. 23, line 10 to 14) to set up this Stanley-Talson defense, and to give the name and residence of Talson himself. Thus notified of the fact that another defendant had relied upon Talson, this defendant paid no attention to him or his story till six years afterwards, when it secured an opening of the case to let in his testimony as newly discovered! (Decree, p. 34, line 1.) Thereupon it filed an amendment to its answer, (p. 31,) and set up the defense, duly mentioning Talson's name.

This court will wonder how testimony, of which we gave the defendant notice in our bill in 1861 could be newly discovered by it in 1867. The answer, however, is easy. The defendant had "discovered" that Talson would swear to an entirely different state of facts about his alleged brake than he swore to in 1854! In 1854 he swore his brake only ran two or three times over the road, and that *he* then changed it to a *single foot brake.* (Blatchford's deposition, p. 475.) In 1867 he swears it was never taken off the car at all to his knowledge, which extended, as we have seen, for seven years, or till 1849. (Talson's deposition, p. 305, q. 11.)

Of course such flat contradiction destroys all credit, but it does not seem to embarrass the learned counsel on the other side. He calmly ignores Talson's testimony in *this* case as unworthy belief, and founds the defense solely on *our* testimony as to what Judge Blatchford says Talson swore to in the Erie case, in 1854; though elsewhere, (p. 47, line 6 of his brief,) he asserts, with quaint inconsistency, that "Talson is a man of the *highest respectability.*"

Now, bearing in mind that Judge Blatchford is only telling us what Talson swore to, and not as to what the facts were, we will look at the Judge's deposition, to see what the real character of the story was, which was doubtless the strongest Talson had been able to concoct up to that date.

He said, (p. 475,) "A double-acting brake was first put on the New Jersey Railroad, by Isaac Newton Stanley, in 1842. It never went into use. It was so light and *imperfect* that it never answered the purpose. *It had three or four levers in the middle.*"

Thus far *Stanley.* Even if his brake had been successful, and had been patented, our patent, so far from being invalidated by it, would not have even infringed it; because in that event we dispensed with all his middle levers but one, besides differing from his brake in other respects. (See the collection of authorities at the bottom of page 64 of Mr. Payson's own brief.) But Talson further said, "I then took Stanley's brake and threw all his gearing off, and applied it like the Jersey model [a model in the Erie case, but not in this]. That model exhibits a double-action brake, with lever in center, *and the brakes between the wheels worked by a cam on a rock shaft. If you take out the arrangement of the Jersey model within the trucks, and put in Tanner's within the trucks, you will have the Tanner brake.*" Indeed! If the appellant only throws away the part of the Talson combination which was, if possible, a worse truck system than the truck system of Millholland, and which could *not* perform the function required of it, and substitutes therefor the self-adjustable truck system of Tanner, and do that twenty years after the Tanner invention was made, then it will have a brake that will anticipate the Tanner patent!!

When, however, that is permitted by the courts, patents covering combinations of old, or old and new, ingredients, will occupy a very different legal status from that which the law now assigns them. Nobody then will have anything to do, in order to invalidate such a patent, but to pick out one ingredient from one old unsuccessful machine, and another ingredient from another old abandoned machine, and another ingredient from a third old machine that failed to work, and put the three *extracted* ingredients together so as to perform the same *result* as the patented combination, and do this thirty years after the latter was invented. Indeed, a defendant don't even need to do that much. He need put himself to no such expense. He only needs to *remark*, when arguing his case in court, that such a thing *can* be done.

Moreover, Talson did *not* say in 1854 that his brake did or could produce any useful result, and admits it would not even theoretically work as well as ours, and says he abandoned it, and went back to the old single foot brake in a week.

Mr. George Gifford, therefore, though doing his best in 1853 to defeat our patent, was for these reasons able to see nothing in this defense. He therefore wrote to his associate counsel the following letter, which he himself testifies (p. 578) was written after a very careful consideration of all the information he could get from Mr. Talson:

New York, October 11, 1853.

Mr. North—*Dear Sir:* Have you heard from Mr. Grosvenor? I find, on examination of the case, 1st. That Thompson and Bachelder invented the brake as early as 1846 or 1847, (see testimony taken,) *and that the one shown in their drawings filed in* 1847 *is not esssentially changed from the one shown in the drawings of the patent.* 2d. That none of our patents which we have as evidence go further back than 1848. 3d. That *the Talson brake of* 1842 *was barely tried and laid aside, and amounts to such an experiment* as the courts have *often* held to be insufficient to defeat a patent. Now, unless we receive aid from the Eastern testimony of prior use, the chances, in my opinion, will be greatly against us. If we expect to avail ourselves of that testimony, not a day should be lost in dispatching some smart, intelligent person to see those witnesses, and to bring them here and thence to Albany.

Is it not possible that the pliantiff's attorney may not be anxious to try the cause this term; and would it not be well for you to telegraph him, asking whether he expects to try?

I perhaps betray some anxiety about the case; for I realize that we are not, and I fear shall not be ready, and *I do hate a defeat.*

GEO. GIFFORD.

THE NICHOLS BRAKE

The appellant also asserts that our patent is void for want of novelty, because it claims that the essential principles contained in the invention were known and publicly used by one Willard I. Nichols in 1846, upon the New Haven, Hartford and Springfield Railroad, in Connecticut. We admit that Mr. Nichols made and used a brake substantially indentical with ours; but we deny that he did so in 1846, or at any other time till long after our invention was made, in October of that year. The principal question here is one of date; and the burden of proof is on the appellant.

The appellant's witnesses on the subject are three in number, viz., Leppens, Hebard, and Mrs. Allen; while those on behalf of the patent are Stockbridge, Fields, and Hebard.

Leppens testifies, on behalf of the appellant, (p. 146,) that Nichols (who was then master mechanic of the Hartford and New Haven Railroad, but who died in 1850) had occasion to build an extraordinary length baggage car in the fall of 1846, and that to such car, when completed, in March or April, 1847, Mr. Nichols applied the Nichols brake; and that not *more* than three months before it was so applied Mr. Nichols, by means of a stick and four strings, showed Leppens how he proposed to make the brake, and told him that he had *conceived the idea the night before.*

Leppens, therefore, so far from helping the appellant, shows that by no possibility could Nichols have first conceived the idea earlier than December, 1846, which was two months after our invention was made. He is not positive, indeed, that the brake was applied before April, 1847, or conceived more than *one* month prior to that date; so that the appellant cannot claim even Leppens to have sworn that Nichols first conceived his invention till *five months* after ours was made.

The learned counsel evidently thinks that Leppens, his own witness, is not a witness for *him* to rely upon; but rather one whose testimony he needs to explain away, lest the court conclude at once that the defense has no merit. Accordingly, he paraphrases his testimony with a remarkably free hand. For instance, counsel says, "Leppens does not *remember* Nichols showing him the drawings, as stated by Mrs. Nichols." (p. 27 of his brief, line 9 from the bottom.) On turning to the testimony, we find that Leppens remembers that Nichols did *not* show him any such drawings; for he says, (p. 148, line 8,) "He *didn't* show me any drawings. He *never* said anything to me about any drawings." Again counsel remarks, "Leppens also says that when Nichols showed it to him he spoke of it as an invention he had just got up. But no one supposes that this invention was got up by Nichols in a day." On turning to the *testimony*, we see that Leppens swore, (p. 148, line 16,) "Mr. Nichols represented to me that it was something recent,—that *he had conceived it the night before.*" The counsel, though substantially wrong in his quotations from the evidence, makes a true comment upon it, when he says that nobody supposes the invention was got up by Nichols in a day; for Leppens swears that it was conceived in a *night.* But counsel continues: "Nichols 'conceived' the idea in the spring of 1846; had various drawings of it during the summer; finally settled upon the form he liked best, and in that form applied it to a car."

Now, Mrs. Allen, upon whose depositions this statement is based, if it has any foundation at all, says in her *present* deposition (p. 148) that Mr. Nichols made the drawings of *a* brake about January, 1846; or, as she states it, just before and just after the shops were moved from New Haven to Hartford, which, she says, was a month after the Nichols family moved,—which latter event, she says, occurred December 1, 1845.

In her *former* deposition, given in the Erie trial in 1854, eight years nearer the event, she said, (bottom of p. 129,) "I should think he drew that plan in the *fall* of 1846; to the best of my recollection, in the fall of 1846,—late in the fall. It was quite cold weather."

As her *first* deposition puts the date of Nichols making drawings too late to be *useful* and her *second* too early to be *true*, the learned counsel divides the difference, and says the drawings were made in the *summer* of 1846.

It is wholly immaterial, however, *when* they were made; for nobody pretends to have ever seen or heard of them but Mrs. Allen, who says, "Mr. Nichols mentioned to me that it was a brake that he was a-drawing, but I did not *inquire* into it, and did not *understand* what he was drawing." (p. 148, line 7 from bottom.) She also says, "Mr. Nichols often explained it to me as a brake, and said it would dispense with one-half the brakemen. I didn't *understand* then *how* it would, and I don't now." And also, "There was another drawing on the same paper, which represented, as I understood, the brake in a *different way*." (p. 149, line 13.) And again, "*I cannot swear* that the *brake* which he put on the car was not *altered* or *different* from the *drawing* which he took out of the house. He did not tell me that he hadn't altered it." (p. 153, line 16 from bottom.)

Even taking Mrs. Allen's present testimony as correct, which, in view of the former disagreeing statements no court would do, nothing is shown; except that early in 1846 Nichols made drawings of at least two kinds of double brakes. That those drawings bore any resemblance to our patent, there is no evidence whatever. On the contrary, it clearly appears to have been *different;* for both Leppens (p. 148) and Hebard, (p. 157,) the appellant's own witnesses, say Nichols never showed any such drawings to them, but explained to them the brake he put on the car by entirely different means. This is accounted for at once, when we remember that Nichols told Leppens, long after Mrs. Allen says the drawings were made, that he had conceived his brake the night before. It seems, therefore, that Nichols had been *endeavoring* to contrive a double brake for some months; but the drawings he made to represent his first crude ideas were so unsatisfactory to him, that he was ashamed to show them to the workmen, Leppens and Hebard; and when he finally did get the correct idea, it came to him all at once, and was so different from the drawings that they were of no use in representing it, and he therefore explained it by means of a stick and some strings; and did this latter thing, according to the appellant's own witnesses, from two to four months *after* our invention was made; and according to our witnesses more than a *year* after the latter event.

We have shown that the alleged Nichols drawings are of no sort of consequence. The other question is as to the time Nichols first put his brake on a car. The appellant says that Hebard's testimony is "too uncertain to be of much value"; (p. 28, line 14 from bottom;) so that on that point he allows us Leppens, Mrs. Allen, Stockbridge, and Fields, the former two saying it was in the spring of 1847, and the latter two in the spring of 1848, that the brake was first constructed.

Mrs. Allen says, (p. 150, line 5.) "I know that it was previous to the first of May, 1847 [that the car came out with the brake for its experimental trip]. I know from the state of my own health, from delicacy, that it could not have been as late as May when I went out on the piazza and saw the car, as I have before mentioned. *My little girl was born in June*, 1847." The learned counsel makes a great deal of this interesting family event, which, however, seems to have been only *one* of a kind rather frequent with Mrs. Nichols; (p. 148, line 7 of Mrs. Allen's deposition;) but the court will notice that Mrs. Allen's recollection as to the brake is wholly argumentative. She connects it with the birth of her daughter in no way whatever, save that in *her opinion* she could not have been well enough in May, 1847, to have stood on the piazza to see the brake car, or for any other purpose, *because* her daughter was born in June of that year. The birth of her daughter in June, 1847, could not, however, have prevented her from standing on the piazza in the Spring of 1848, which is the time, as we shall show by Stockbridge and Hebard, the brake was first actually put on the car.

This ought to eliminate Mrs. Allen from the case; and it would render any further reference to her, in regard to the present issue, unnecessary, had not the appellant appealed to the court, at the close of its brief on this point, to decide this issue in its favor,—not because it can even claim to have proved the defense with the certainty that the law requires, or indeed to have done anything but to *disprove* it, but, forsooth, because Mr. Tanner and Mr. Sayles endeavored, as the counsel states, to gain the good-will of Mrs. Allen by promising her a handsome present in case the Erie suit of 1854 was decided in favor of the patent, and therein were guilty of bribery!

Mrs. Allen, however, does not claim that Mr. *Sayles* made any such promise, but, on the contrary, explicitly says, (p. 151, line 18,) "Mr. Sayles never made me any compensation for my time, and never *offered* to."

As to Tanner, we have Mrs. Allen's word that he did promise her a handsome present "when his ship came in"; or, rather, when he gained his suit.

It could not, however, have been understood to be in the nature of a bribe; for she did all she could to defeat him in the Erie case, and to defeat Mr. Sayles in this case,—testifying in the former case, (p. 129, line 10 from the bottom,) "I saw the drawing my husband made; *he showed me how it operated.*" This last statement was more prejudicial to the patent than anything she said in her second deposition. In this case, however, she sought to carry the date of the drawings nearly a year farther back that she stated it in the Erie case; but, on the other hand, contradicted her above italicized statement by saying, (p. 149, line 22,) "Mr. Nichols *often* explained it to *be* a brake, and said it would dispense with half the brakemen. I didn't *understand* then *how* it would, and I don't now." And again, (p. 153, line 11 from the bottom,) "I can't give a description of this brake."

Notwithstanding she did all she could to defeat Tanner in the Erie case, even swearing to an important statement which in this case she contradicted, she afterwards applied to him for a fulfillment of his promise,—thus showing that it was not regarded as being contingent on the character of her testimony, but on the result of the suit. Tanner replied in a letter (p. 155) tacitly acknowledging the promise, but saying that Mr. Sayles assumed it when he purchased the patent, and advising her to call on Mr. Sayles for its performance.

She says (p. 151) she accordingly did call on Mr. Sayles, and instead of treating the claim as an *unearned* bribe, and *therefore* refusing to pay it, as he would have done had it been an intended bribe, he merely said that he had not assumed Tanner's debts or promises when he purchased his patent. She adds, (p. 151, line 8,) "I could not *get* Mr. Sayles to promise me anything till he was about leaving. He then said he was going South, and if he should succeed well he *might* give me something himself."

It is with great regret that the writer feels obliged to explain these circumstances; for they seem to reflect very severely an a *woman*. In justice to her, however, it ought to be said that Mrs. Allen's memory is confessedly a weak one, as appears from the numerous discrepancies in her deposition, that could easily be pointed out if it were worth while, and by her own admission on page 154, (line 12 from bottom,) where she says, "I *never* had a very long memory; I do not remember [*now*] near as well as I *used* to."

The lawyer on the other side has compelled us to make this analysis of the truth, by what we have seen are entirely unfounded aspersions on the conduct of the appellee.

Coming for the first time to the Supreme Court, the writer did not expect to find cases argued here as they too frequently are in the remote West, to wit, by abusing the opposite party.

Having thus been compelled to follow the learned counsel for the appellant in his wide detour from the point, the court is now doubtless desirous of being told *when Nichols made his brake.*

On this point, Hebard, the appellant's own witness, swears (p. 157, line 26) that it was first successfully applied one Spring (p. 125, q. 4) by the hands of John Stockbridge—having been experimentally tried on an old car standing in the paint shop during the previous winter—to the first car Nichols ever built for the company; and Stockbridge swears (p. 126, q. 2) to the same effect, and that he never worked for the company at all till April 1, 1848, and that he put on the brake on the new car soon after he began; and that he knows it was April 1, 1848, he began to work for the company from reference to the *books* of the company, as well as his own recollection.

The learned counsel sees, that, unless suppressed, this testimony is fatal to this defense, but he succeeds in ejaculating, "This evidence is purely *hearsay*, and *incompetent*, because the *books* were not *produced*." (p. 28, line 4 from bottom.)

The learned counsel came to the bar soon after the writer of this was born, and therefore has not read the elementary works on evidence so lately as the latter. If he had, he would remember that it is rather too late to interpose a technical objection for the first time when the case is in the Supreme Court of the United States on final appeal; and would know that the objection has no *foundation* even if it had been interposed when the testimony was *taken;* because, inasmuch as the books belonged to a corporation, a stranger to this suit, and were, moreover, a thousand miles away from the jurisdiction of the court below, they *could* not be produced, and that in such cases parol evidence of their contents is admissible.

The testimony of the three mechanics, sums up as follows: Hebard and Stockbridge both say that the latter was the man who constructed the brake, under Nichols' direction, and the latter shows that he did it after April 1, 1848. Leppens shows that it was so applied not *more* than three months after it was first conceived; so that it clearly appears that Leppens and Hebard *at first* merely fixed their unrectified recollection as to the invention one winter further back than it occurred. It follows, therefore, that the Nichols brake was not even *conceived* till at least fifteen months after the Tanner was invented, twelve months after the Bachelder model was made, six months after our patent was applied for, and three months after our brake was successfully operated on a car on the Fitchburg Road.

JOHN TYLER CAR.

The appellant's fourth and last attack on the validity of our patent for want of novelty, is based on the alleged use of a brake precisely like ours on a certain passenger car called the "John Tyler car," on the Camden and Amboy Railroad, as early as June, 1843, and continuously for years thereafter. We insist that no such brake was ever on any car of that road till a considerable time after our invention.

The question is *not*, as stated by the appellant's counsel, whether there was such a brake on that road prior to 1851. With equal propriety, he might say 1861 or 1871. The question is as to whether there was such a brake on that road prior to our invention in October, 1846. This is a very material distinction, inasmuch as eleven of the appellant's witnesses do not *pretend* to know of the brake prior to October, 1846, but do claim to know of it between 1846 and 1851.

The learned counsel devotes exactly four pages of space to these eleven witnesses, and, with a single exception, enlarges and declaims about them precisely as he does about the balance of the great army of railroad employees he so portentiously marshals in battle array.

We cannot consent, however, to allow the appellant's case to be supported by any such devices. We therefore insert here a list of the names and numbers of the eleven witnesses, so that the court may distinguish between the material and the immaterial, without performing the labor otherwise required to sort them out.

No. 4. Letchworth Cox.
No. 8. R. C. Wallcott.
No. 9. John H. Jobes.
No. 12. Thomas Herbert.
No. 18. Joseph Reed.
No. 19. Joseph Hagar.
No. 21. John H. Hillman.
No. 23. Joseph Capner.
No. 26. H. H. Disbrow.
No. 27. Charles Cox.
No. 28. William Disbrow.

Moreover, three of the *strongest* of the eleven witnesses (viz., R. C. Wallcott, No. 8; Joseph Capner, No. 23; and H. H. Disbrow, No. 26) afterward RETRACTED their depositions, and swore they were in error in making the statements they contained about the double brake. (See retractions on pp. 583, 571, and 575 respectively.)

The court will observe, on page 34 of the learned counsel's brief, that he comments upon the testimony of Fielder, No. 11, as being "very convincing," when taken in connection with that of Gamble and Jobes. We have already said that Jobes don't go back of October, 1846, at all; and the counsel himself don't pretend that he goes any further back than into Talson's time; *i. e.*, back to 1849. Therefore, it must be the combination of Fielder and Gamble that is so "convincing" to the learned counsel.

The fact, however, *is*, that neither those men nor Hurd (No. 31) refer in the least to the John Tyler car, or any other car on the Camden and Amboy Road! They refer entirely to the *Stanley-Talson* brake on the *New Jersey Central Road.* Their testimony, such as it is, was taken to bolster up Talson in his *second* deposition, where he says the Stanley-Talson brake was an entire success, and ran at least seven years to his knowledge,—a statement of the case which the learned counsel admits, when discussing the Stanley-Talson brake, (p. 23 of his brief,) to be untrue.

As thus far purged, the grand army of the appellant is reduced from 32 to 18. These *did* swear that our brake was used on the John Tyler car prior to October, 1846, the date of our invention.

Upon the shoulders of these eighteen rested this defense of the Tyler car; a defense to which the appellant's counsel devotes more than thirty-two pages of his argument, being a third more than to all the other five arguments on validity combined; a defense which makes up in dignity what the others so sadly lacked in that attribute; a defense which one thing, and one thing only, could ever hope to overcome. That one thing is *TRUTH.*

Of these eighteen men, the five following were among the most positive, the discussion of their testimony occupying more than three pages of the appellant's argument:

No. 6. CHARLES YUNDT.
No. 7. WILLIAM CRIM.
No. 20. WILLIAM COULTER.
No. 22. JAMES SEEDS.
No. 25. ASHER PANCOAST.

THESE MEN ALSO RETRACTED.

On calm reflection, they concluded they had been in error, and gave depositions to that effect, to be found on pages 559, 600, 611, 602, and 601 respectively.

The counsel, in referring to two of these retractions, (Seeds and Pancoast's,) says, "We are not sure that our case is not helped quite as much as it is injured thereby!" (p. 55, line 21.)

No. 22. Seeds.

Mr. Seeds was *originally* far stronger for the appellant, than any witness who did *not* retract. He said (p. 245) that it was a matter of *positive recollection* with him that the Tyler car had a double brake on in 1844, from *using it daily.* In his retraction, however, (p. 602,) he took it all back, and the appellant neither cross-examined him, nor attempted to throw mud at him afterward. The vials of its wrath were all spent on Pancoast, who originally was even stronger and more *circumstantial* than Seeds. (p. 251, q. 11, 12.)

No. 25. Pancoast.

Pancoast, who was one of the choice spirits of the earth when giving his testimony *for* the appellant, when *he* thinks the matter over and retracts, is accused by the learned counsel of two crimes and one vice, to wit: *Perjury, Bribery,* and *Drunkenness.*

Perjury. To substantiate this charge, the counsel says Pancoast testified that one Ryhow had told him that the patentee had a suit against the Camden and Amboy; whereas there *could* have been no suit, because the road had a license. But that don't prove that Ryhow did not *tell* him there was a suit. But the counsel also says Pancoast was a perjurer, because he afterward said that he understood Mr. Van Rensselaer had paid Mr. Sayles for the right. *That* scarcely proves perjury, because some days elapsed after Pancoast's interview with Ryhow before that with Lockwood, in some one of which, he doubtless learned that Ryhow was mistaken.

Bribery. This charge is based solely on the counsel's allegation that Mr. Sayles was none too good to bribe him. Now, let us see whether this last statement is a warrantable one. The charge is based on four specifications: 1st. The "handsome present" to Mrs. Nichols-Allen; 2d. The $1,000 bond to her; 3d. Sayles' alleged attempt to bribe Lockwood; 4th. Sayles' alleged attempt to bribe Talson. We have, in discussing the Nichols brake, seen that Mr. Sayles had nothing whatever to do with the "handsome present" promise. As to the $1,000 bond, it was given by Tanner in 1851, before either he or Mr. Sayles had ever even heard of the Bachelder and Thompson invention. It was given without Mrs. Nichols' knowledge, or that of Mr. Sayles; and the statement that Mr. Sayles ever assumed to pay it is shown by Tanner's letter to Mrs. Allen (p. 155) to be an entire error. (So also p. 151, line 4.) Moreover, Tanner's motives in giving it were probably rather praiseworthy than blameworthy. (p. 541, x-q. 8.)

The alleged attempted bribery of Lockwood rests wholly on Lockwood's word, whom we shall soon shew by fifty witnesses to be worse than unreliable.

As to his alleged attempt to bribe Talson, it rests on the testimony of Talson and Cudlip.

Talson shows his malice by dragging in the charge quoted by the counsel from page 324, cross-question 203, where it was wholly irresponsive to the question. Moreover, it is an absurd statement, because Talson adds, that accordingly, "When I would begin to advance anything in explanation of the model, the counsel on Mr. Sayles' side would say to me that he did not want me to talk about that,—he wanted me to talk about some other part of the model; the counsel for the railroad company did not sustain me, and I let it go without explanation." It appears, therefore, that what Mr. Sayles bribed him to do, and what he did do, was to *refrain from explaining the model.* Turning to his testimony on that occasion, (p. 475,) it will be seen at once that he *did* explain the model in detail. Moreover, it is barely possible that George Gifford, the attorney for the defendant, could have explained the model to the jury without Talson's aid. (See also p. 490, q. 2.)

Cudlip is positively contradicted by Mr. Sayles, (p. 589, q. 3, 4, 8,) by Isaac P. Wendell, (p. 580, q. 11,) and by David H. Baker. (p. 607, q. 1 to 14.) This last gentleman succeeded Talson as master car builder on the New Jersey Road in 1849, and continued to hold the position up to the time of the giving of his deposition, in 1868. He has testified three times to the truth, in our behalf, on various points in this case, though, as he says, (p. 608, q. 7 to 11,) he has always done so against his will, for fear of offending his employer, the railroad company. Moreover, Cudlip is circumstantially shown by Reilly (p. 611, q. 1 to 9) to be a criminal in money matters. His testimony against Mr. Sayles doubtless sprang from keen disappointment, because he could not *get* Mr. Sayles to bribe either him or Talson, his relative.

From the foregoing references to the proofs in the case, it would seem that the honorable counsel for the appellant might have omitted from his argument these charges against Mr. Sayles, and still have done the whole duty which a client has a *right* to expect from a counselor.

Drunkenness. This charge against Pancoast is based solely on Lockwood's statement, upon whose veracity we still have to comment at large. Mrs. Pancoast swears (p. 626, q. 7 and 8) that her husband had not for 30 years spent an average of half a dozen evenings a week away from home, and had never been under the influence of liquor but three times in the 30 years, and then only slightly so. She adds, that Mr. Pancoast was, and had been for 14 years, a member of the Methodist Episcopal Church in Camden.

The charge of the honorable counsel, at the top of page 57 of his brief, that Pancoast "had left the path of truth," seems rather to have shifted, and to be quite applicable to his own witnesses, and quite inapplicable to Pancoast.

Strenuous endeavor was made by Thompson, (appellant's witness No. 2,) whom the learned counsel cordially indorses, because he has been Mayor of Bordentown, and also member of the Legislature—strenuous endeavor, we say, was made by Thompson to reclaim Pancoast to the path not of truth, but of Lockwood and

Thompson, truth or no truth. The dialogue between them may be found on page 624, q. 10 of the record, and is as follows:

"*Thompson.* 'Pancoast, how are you? I am glad to see you. You are the man I have been looking for all day. I have been over to your house. What I was going to say is about that brake. You have put myself and Lockwood in a bad fix.'

"*Pancoast.* 'I don't know what kind of a fix you are in, but *I know I was mistaken* when I came to talk with my old men I had railroaded with."

"*Thompson.* 'Oh, I suppose Mr. Sayles has paid you, or promised you, like he has some of the rest, twenty per cent. of the patent.'

"*Pancoast.* 'Mr. Sayles never promised me a cent, but I suppose every man has his price?'

[N. B.—So far from reflecting on Mr. Sayles, the context shows that Pancoast was doing a little detective work, in order to ascertain whether Thompson's great anxiety to find him meant *bribery from the railroad.* And, moreover, he was successful; for the offer to bribe came at once; not, indeed, in the form of money, but a situation as engineer, which was the very thing he most needed at that time, and could not get, though he obtained an excellent one afterward, and prior to this deposition. Thompson said:]

"*Thompson.* 'You had better go back to the company; you were brought up there.'

"*Pancoast.* 'I don't care about the company, nor anybody else. I WANT EVERY MAN TO HAVE HIS RIGHTS.'

No. 7. Crim.

The counsel for the appellant misses the point of this man's retraction, confining his criticism to collateral matter. Let us see what Crim says about the John Tyler car, which is the only passenger car the learned counsel claims had the double brake on prior to 1846. (Top of p. 31 of his brief.) We print here exactly what Crim said about that car, when testifying for the appellant. (p. 206.)

"Q. 10. Do you know anything about the use of a car on that road, called the John Tyler? If so, what was there peculiar about it that makes you remember the case?

"A. The car was called the John Tyler, and it had different seats from what cars have nowadays; they worked on a pivot; some were round, some arm-chairs, and different shapes.

"Q. 11. Do you know, of your own personal knowledge, that there was in use upon said John Tyler car, in the year 1845 or 1846, a double-acting brake, like the one here on model Exhibit A?

"A. Yes, sir."

The retraction of this witness was not brought about, as the counsel says, by merely looking at a car on the Camden and Amboy Road. On the contrary, it, together with that of Yundt, his companion, was chiefly brought about by reflecting on the matter on their way home from New York, where they had been testifying for the appellant.

Notice the material part of the language of the retracting deposition (p. 600):

"Q. 1. Have you been examined before, in this case, on the subject of brakes on the Camden and Amboy Road?

"A. Yes, sir.

"Q. 2. Was that examination in New York?

"A. Yes, sir.

"Q. 3. When you were returning home from examination, who was with you?

"A. Charles Yundt.

"Q. 4. When so returning with said Yundt, did you talk over your examination in New York? And if so, did you come to any conclusion about it? And if so, what was the conclusion?

"A. Yes, sir, we did talk it over. I told Yundt I thought we were both *mistaken*. We had both spoken about double brakes; and I told him I thought they were not connected so that one truck would work with the other. They were *separate* brakes.

"Q. 5. Now that you have thought the matter over, state what kind of a brake you now say was on the John Tyler car.

"A. Well, sir, it was *called* a double brake; but this double brake, as it was *called*, had a brake at both ends of the car, and each brake was separate; and one brake did *not* brake all the wheels. *One* brake broke on *one* truck.

"Q. 9. Will you state how many brakemen you now say were required to put on all the brakes at the same time on the John Tyler car?

"A. It took *two* brakemen—one at *each* end."

Cross-examination waived by counsel for defendant.

No. 6. YUNDT.

This man is Crim's companion witness, both in his original deposition and in his retraction.

As to Yundt, however, there was a sequel that did not occur in Crim's case. Like Pancoast, he was subjected to the blandishments of Thompson, which he at first resented with vigor, and even with profanity, (p. 633, line 8,) but to which he afterward yielded so far as to reply as follows, to a question from the appellant's counsel (p. 631):

"X-Q. 5. Did this brake [on the Tyler car] operate on both trucks at the same time?

"A. I *think* it did, to the best of my knowledge."

Prior to this last deposition, however, but some months after the retraction of his first deposition, he very explicitly reiterated the statements of the retraction, in the presence of Wendell (p. 631) and of Hubbard (p. 632).

No. 20. COULTER.

This witness also retracted, though that fact would never be guessed fron reading the brief of the learned counsel for the appellant. More space and emphasis are devoted in that brief to Coulter's deposition than to any other of the eighteen except Pancoast, who, as we have seen, *also* retracted.

Coulter was inquired of by the appellant about certain circumstances alleged to have occurred on the Tyler car in the Fall of 1845 or the spring of 1846. These were the "hitting on the hand" circumstances, and are alleged by the appellant's counsel to have been identical in character with those alleged to have occurred to James C. Hillman on the same car in August, 1845, and to John H. Hillman in May, 1848. To save repetition, we will explain that matter when we come to discuss James C. Hillman's testimony.

Without regard, however, to those circumstances, Coulter positively swore of his own knowledge that the brake which was on the Tyler car when that incident of the "hitting of the hand" occurred, did apply the power to both trucks at the same time. (p. 240, q. 5 and 6.)

His retraction is to be found on page 611, where, being asked "What kind of a brake do you think was on that car?" he replied, "It is impossible for me to tell."

THE FAITHFUL THIRTEEN.

We have thus shown, that of the 32 witnesses with which the counsel started out, 14 were wholly immaterial, and 5 of the very strongest of the material 18 retracted, leaving 13 still to be considered.

No. 1. Lockwood.

He swears that the brake was put on the Tyler car in May or June, 1843, where it continued in use till the fall of 1865, *and that it was applied to all the passenger and baggage cars on the road as fast as the latter could be spared off the road for that purpose.* (p. 169, q. 5.)

That this story is purely a work of the imagination, we will now arrange the evidence to show.

First. Henry Tanner says (p. 536, q. 4) that he visited Lockwood in 1851, to try to induce him to buy the right to use the Charles B. Turner double brake, (the invention heretofore sufficiently described,) and Lockwood declined to do so, because he was about adopting the Hodge. He further says (p. 539, q. 2, 3, 4, re-direct,) that the model he showed Lockwood on this occasion was identical with the Tanner brake. That being the case, it was identical with what Lockwood *now* claims he himself applied to the Tyler car in 1843. Tanner also says (p. 538, q. 19) that during that interview Lockwood said no solitary word about having himself used the same thing in 1843, or after that time.

Second. Mr. Sayles, the appellee in this case, testifies (p. 454, q. 2 to 6) that he called on Lockwood in the summer of 1852, with the letters-patent for the Tanner brake, for the purpose of inducing him to buy the right to use it on the Camden and Amboy Road, and that Lockwood told him Tanner had called on him with a model of the same thing some time before, but did not say anything about such a form of brake having been used on his road. Mr. Sayles also says (q. 7 to 9) that in 1853, after the Stanley-Talson defense had been set up by the defendant in the case of Tanner *v.* The New York and Erie Railroad Co., he went to New Jersey to learn the facts, and, calling on Lockwood again, was told by him that he had never seen anything of that or any other double brake till he saw the Hodge some two or three years before; *i. e.*, in 1850 or 1851.

Third. Francis A. Stevens, a witness calmly ignored by the learned counsel, though the brake he invented is much extolled by him, testifies (p. 513, q. 7 to 13) that *he* went to Lockwood about 1854, for the double purpose of introducing his brake and getting evidence to defeat our patent, but never heard a word from him about any use of a double brake prior to our invention.

Fourth. Henry Waterman testifies (p. 464, q. 3) that in 1859, when trying to obtain evidence to defeat the Hodge patent, *he* called on Lockwood, and was informed by him that they *commenced* with double brakes on their road with the Hodge, and afterwards took it off and put on the Tanner, and found it worked better than the Hodge. He adds, (p. 466, q. 2, re-direct,) that Lockwood said nothing whatever about having used the center long brake in 1843.

Fifth. William Wheeler Hubbell testifies (p. 546, q. 21 and 24) that, when diligently searching for information to defeat our patent, in 1860, he called on Lockwood, and learned from him that the first double brake used on the Camden and Amboy Road was the Hodge, with swinging levers, and the time when it was first used was about 1851.

Sixth. Lockwood himself says (p. 169):

"Q. 4. How long were said brakes in use on the Tyler car?

"A. From the time they were put on in 1843, until the car was destroyed some two years ago last fall, [*i. e.*, fall of 1864,] as unfit for use.

"Q. 5. Was the brake applied to other cars on the Camden and Amboy Road? And if so, to what extent?

"A. They were applied to other cars. We applied it to a crate car for carrying *baggage*, *directly* after that. We continued *then* putting it on *all* our cars for passenger and baggage use, as we could spare them off the road. At that time our cars were very limited, and when we took *any* of them in for repairs we applied the brake."

Here is a statement that the learned counsel don't even *pretend* is true.

Fifty-one witnesses were called, on both sides, as to the use of the double brake on that road prior to 1851; and the learned counsel has not been able to find *one man* who does not diametrically disagree with Lockwood in his positive statement about a matter that, if it occurred, was so open and noteworthy that it is not *possible* that Lockwood could have been the only man who knew it out of the fifty-one.

The learned counsel carefully omitted this sweeping assertion from his epitome of Lockwood's deposition. He knows very well that he can never drag any such testimony as *that* through the Supreme Court, and therefore he does not attempt it.

In what Lockwood says about the putting on of the crate-car brake after it was put on the Tyler car, five only of the faithful thirteen agree with him. As, however, they all place the crate-car brake subsequent to the other, our evidence, which negatives the statement that it was on the Tyler car prior to our invention, must also disprove the claim that it was on the crate car before that time.

Out of the mouths of *five* witnesses comes the unanimous testimony, that shows, that, so far from Lockwood's story being true, he *knew* that no double brake was used on his road prior to our invention. Out of his *own* mouth comes a story which not one other of the appellant's witnesses would indorse, and which all of our witnesses together clearly disprove.

Dripps, another of the thirteen, also told Hubbell, (p. 546, q. 21,) about the same time that Lockwood did, that no double brakes were used on the Camden and Amboy Road prior to the introduction of the Hodge, in 1851.

We will now review the testimony of the eleven subordinate mechanics who say they remember the brake as being on the car prior to October, 1846, the date of our invention.

Stockham, (p. 227, q. 5,) Dunn, (p. 231, q. 3 and 4,) N. F. Smith, (p. 184, q. 4,) and Venable (p. 190, q. 7) claim first to have seen the brake on it when it was being retrimmed, repaired, and repainted, "during the winter of 1844–45," as Dunn says.

Now, it is impossible to believe that the Tyler car, which nearly all the witnesses on both sides agree was fitted up with unprecedented expense and completeness in June, 1843, should need to be refitted and repainted "during the winter of 1844–45," only a year and a half afterward.

Those four men are simply mistaken as to the time; for Thompson, the appellant's own witness, shows (p. 181, x-q. 20–23) she was not overhauled the second time *earlier than* 1849.

Thompson also says he furnished the trimmings for the car in 1843, and again in 1849, and perhaps several times after the latter date. He only claims to have noticed the brake on one of these occasions. With what convincing certainty can he say, after the lapse of a quarter of a century, that it was not one of the last of these times, and not the first, that he did so?

Buzby says (p. 270, q. 2) that he was employed in the Camden and Amboy office as a clerk and time-keeper from 1840 till 1867, and that (q. 12) on one occasion he noticed that the Tyler car had a double brake on, after being refitted. Living, as he did, a perfectly monotonous life for twenty-seven years, and noticing, as he doubtless did, the Tyler car after *all* of its refittings, he strains our credulity very greatly in asking us to believe he can remember on which of these remote occasions it was that he first saw the double brake upon it.

Bogy (p. 266, q. 2) says he was a brakeman for five years, beginning July 4, 1843, and that some time during that period he saw a double brake. As in order to affect our patent it would have to be in the first half of this period, Mr. Whipple pressed him to be more definite, whereupon he said it was "along in 1844 and 1845." How can he say, after twenty years, that it was not "along" in 1846 or 1847, or even much later?

James C. Hillman. This witness says that in August, 1845, when he was a boy of fourteen, he "made a practice of being around the railroad" when out of school, (not a practice very well calculated to lay the foundation for habits of veracity, as we shall see,) and that on one of these occasions he and other boys of the same sort got around the Tyler car one day and commenced "fooling with the brakes," in the course of which "fooling" he was struck in the side with the brake handle, and it gave him a pretty "severe lick." He continues: "My inquiry was, then, who done it and what done it, and the boy told me, on the other end, that *he pulled* the brake out of my hand."

In commenting upon this, as proof that the car must have had on the Tanner brake, the learned counsel says: "If this evidence is not true, there is no use in ever trying to prove anything!" In fact, it is as "convincing" to the learned counsel as was the testimony of Fielder and Gamble. It, however, requires only a glance at the Tanner model to see that it is wholly impossible for a person at one end of the car to *pull* the brake out of the hand of a person at the other end. The effect of "pulling" on one windlass is not to *tighten*, but to *loosen* the connection between the center lever and the other windlass. This explanation also disposes of the labored argument the learned counsel based on the same alleged facts in the case of Coulter, and disposes of it on the very principles he there lays down. He there says: "The appellant did not offer Coulter as a philosopher, but simply to tell the facts. Any one can prove a fact, though it may take a philosopher to explain it." So, also, any one can bear false witness; but in the case at bar it don't take a philosopher to disprove the statement. The moment one ceases to *assume*, and begins to *think*, it appears at once that no such *pulling* as Hillman swears to could have occurred with the Tanner, or alleged Tyler car brake.

When the learned counsel reads this brief, which will be filed three days before the argument, he will no doubt attempt a change of base on this point, and will claim, on the hearing, that it was the *letting go*, and not the *pulling*, that gave Hillman the "pretty severe lick." If he does this, however, he will only avoid Scylla to be wrecked upon Charybdis, because Hillman says it was the *pulling*, and his brother (John H. Hillman, who is one of the 11 immaterial, though doubtless untrue or mistaken witnesses, heretofore referred to) puts his knowledge of the double brake on the same ground. He says: "In May, 1848, I was coming from Philadelphia to Trenton. I was asked to help put on the brake, by the conductor. I took hold of the crank of the brake, and felt another person *drawing* the brake at the other end of the car." (p. 243, q. 7.)

Now, under no possible circumstances could a person at one end of a car, with the Tanner brake, either "pull," as James C. Hillman says, or "draw," as John

H. Hillman says, against or from a person having hold of the windlass or crank at the other end. Such a result *would* follow from such a cause with the *Hodge* brake, and did so happen in 1851 with Jeffries, to whom the counsel refers as corroborating the theory adopted by the Hillmans. That circumstance explains the whole matter. The conspirators, seeking to invent a plausible story, made experiments with the Hodge brake, which was the double brake nearest at hand; and found that a man at one windlass could "pull" or "draw" against the man at the other, and jumped to the conclusion that it would do so with *any* double brake. They thereupon contrived this story so as to secure belief, quite unmindful of the fact that "the practice of being around the railroad when out of school," though well calculated to teach them to bear false witness, was not so well adapted to make them do so skilfully. The Hillman brothers illustrate anew the fact that *truth* cannot be successfully counterfeited.

Coulter seems to have been troubled in his mind after he gave *his* "hitting of the hand" deposition, and made some experiments with the different double brakes, with the result of finding that it was the *letting go*, and not the *pulling*, that could cause such a result with the Tanner brake. He accordingly did two things, to extricate himself from the position in which his deposition was then seen to place him. That part of it in which he stated that he learned, after the "hitting of the hand" incident, that the car had the Tanner brake on, he retracted. That part about the "hitting of the hand" he patched up. One year and twenty-eight days after his first deposition, he gave another, saying that it was the *letting go* that caused the "hitting of the hand." When asked how he *knew* "letting go" would have that effect with the Tanner brake, he said, "I have experimented with it since." (p. 340, q. 5.) He therefore adds a great many new statements about "the hitting of the hand" incident, in order to make it conform to the "*letting go*" theory. He evidently knew nothing of these when he gave his first deposition; for he there both said and showed that what he had to say was "*very brief*."

Joseph Head. This witness gave a deposition which was, on the *direct* examination, altogether more invulnerable than that given by any other of the defendant's faithful thirteen. Only five questions were put to him, and the answers he gave, unlike those of every other of the thirteen, made out a case without a flaw. The learned counsel for the appellant very justly remarks, when commenting upon that direct examination, "Here is a witness whose testimony it *seems* impossible to doubt." When, however, he came to the *cross*-examination, Head suffered total shipwreck. Observe his deposition, on page 236 of the record:

"X-Q. 22. While you knew this Tyler car, where did it run to?

"A. It ran on the mail partly, and partly on the Trenton way train, and stopped there and went no further.

"X-Q. 25. While you knew about it, did it run on any other kind of trains than the mail and way trains?

"A. Not as long as *I* had charge of it.

"X-Q. 26. Now, what is the best information you can give us as to how long you had charge of it?

"A. Well, I should judge I had it from five to six years, counting from 1845; but I can't speak positively."

When he speaks of 1845, he means March of that year, when he carefully proves, by a letter of the 21st day of that month, he took charge of the Tyler car.

The learned counsel, however, required to sustain B. L. Wallcott, whose testimony refers to seeing the Tyler car a few weeks after his marriage, in April, 1845, (p. 216, q. 3,) *upon an entirely different train* from either of those Head swore she ran upon exclusively, viz., an excursion train upon an entirely different branch of railroad.

In order to do this, he has laboriously analyzed the testimony of ten witnesses, who swear the car ran in that excursion train a large share of the time during all the six years referred to by Head!

The appellant's counsel could not have *both* Head and B. L. Wallcott, and he concluded to give up Head. It is probably these two witnesses he refers to on page 45 of his brief, when, in summing up the merits of the case, he says:

"*Third.* In the midst of all this diversity, these witnesses yet preserve the most remarkable unity and harmony as to all those matters upon which *any two* of them *happen* to testify."

B. L. Wallcott, though purchased, as he was, at the great cost of giving up his splendid witness, Joseph Head, can never be other than a disappointment to the learned counsel.

To show that this is the case, we will exhibit one of his many self-contradictions. First observe the following, on page 218:

"X-Q. 38. Did not Mr. Lockwood say anything at all to you when he first spoke to you concerning the Tyler car, about wanting to know what brakes it had?

"A. Yes, sir; he asked me if I knew what kind of brakes the Tyler car had on, and I told him I would have to *study* a little."

Now observe the following, on page 222:

"X-Q. 77. Are you *sure* that he [Lockwood] did *not*, at that first interview, say anything more to you than to remark that he wished you would study up what you could about the Tyler *car?*

"A. That is all he said. He said no more.

"X-Q. 78. Do you swear positively to that?

"A. Yes, sir.

"X-Q. 79. Did he not say anything to you, in that interview, about the *brakes* of the car?

"A. *He did not!*

"X-Q. 80. Will you swear positively that he did not say anything at all to you about the brakes at that time?

"A. He did not, at that time. I will swear *positively* to that."

It will be seen that this strange stultification is consistent neither with sound veracity nor good recollection. In the *absence* of both those qualities, it can *easily* be accounted for. In the earlier part of his cross-examination, he had said that, when first visited by Lockwood and inquired of about the brakes on the Tyler car, he told Lockwood he would have to "study" before he could tell him. Seeing, as the cross-examination progressed, that it was asking a good deal to require people to believe that he could be *positive* of so improbable a statement as that the double brake *was* on that car a quarter of a century before, he endeavored to show, in response to cross-question 75, that he was a man gifted with extraordinary powers of memory. Accordingly, he rehearsed what he said he had told Lockwood about the minute details of the car before he had any hint from Lockwood as to which of these particulars he required information upon. In order to impress everybody with the genuineness of the recital, he inserts the description of the alleged brake as number 12 in a list of thirteen particulars. He still further overdoes the matter, by giving the most minute description of the parts of the brake, even remarking the length in *inches* of a particular chain, and the exact arrangement of every part of our patent; and then he triumphantly said he was able to recall all these particulars to mind, and did enumerate them to Lockwood, without Lockwood having lisped a syllable about the brakes. So far, however, from possessing such a Herculean memory as would be required to carry all those minute particulars of a machine so many years, he did not even remember that he had sworn within an hour that Lockwood asked him about brakes the first thing; and he told Lockwood he could tell him nothing without study!

And this is the witness whose cross-examination the learned counsel says (p. 35, line 22) "proved still more clearly the fullness and accuracy of his recollection."

It is *this* witness also, together with James C. Hillman and Coulter, two of the "hitting of the hand" witnesses, and Charles Cox, who don't pretend to know anything about *what* brakes were used till February, 1848, that the learned counsel selects and sets up at the end of his argument as the corner-stones of the Tyler car defense.

The counsel omits Talson from among his witnesses, notwithstanding he denominates him (p. 47, line 6) as a man of the "highest respectability," and notwithstanding he swore this defense through without an outward-appearing qualm. (p. 306, q. 15.) The learned counsel, however, evidently thinks that Talson's testimony is incredible, for many reasons, among which are these: 1. He is a proved perjurer, on the testimony of Judge Blatchford, as we have seen in a previous part of this brief, while discussing the Stanley-Talson defense. 2. George Gifford, (p. 522, q. 6 to 10,) Thomas M. North, (p. 495, q. 8 to 14,) and W. W. Hubbell (p. 544, q. 10) all testify that they made strenuous efforts to secure evidence to defeat our patent in 1853, and to that end applied to this same Talson for information of prior use; and that though Talson was very willing, and even anxious, to help them, he never said a word to either of them about any knowledge of prior use on the Tyler car.

Thus, out of their own mouths, the appellee has refuted, or shown to be wholly unreliable or immaterial, every one of the appellant's witnesses on this issue, save *Conover*. *He* was no doubt *intentionally* wicked. We base this statement on two grounds: 1. The avidity with which he positively swore to all the particulars he thought would be useful to the appellant, before his interrogator had asked him a word about brakes, or even mentioned the subject. 2. His refusal to give any *definite* answer to any collateral question, lest he should furnish material for disproving the main statement. These are some of the symptoms of perjury. In his opinion of 1871, (p. 67, par. 4,) Judge Drummond said: "I think that the witnesses who state that the double brake, combining the two trucks in the manner of the Tanner patent, was on the John Tyler car in 1843, are mistaken, or testify untruly." No doubt his honor placed Lockwood, Talson, Dripps, Conover, Head, B. L. Wallcott, and James C. Hillman, in the latter category, and all the others in the former.

APPELLEE'S PROOFS.

The learned counsel for the appellant complains of our testimony because it is *negative*. We reply, that it is negative *only* as truth is the negation of falsehood, and in the sense only in which learning is the negation of ignorance, and virtue of corruption. In every other sense, it is as *positive* in kind, and more so in *degree*, than that of the appellant.

William Quigley.

William Quigley began in 1843, at the age of 18, to work as extra brakeman on the Camden and Amboy Road, acting as such once or twice a week (p. 477, q. 2, p. 562, x-q. 18) until 1847, when he became a regular brakeman for some years, and then a fireman, and then a brakeman again, and then an engineer on the road, which was his employment when, after twenty-five consecutive years of service, he gave in 1868 his deposition for the appellee. He was, from 1843 onward, almost as familiar with the Tyler car as the Justices of the Supreme Court are with their robes, (p. 479, q. 25; p. 484, re-direct q. 2,) and knew very well indeed that it was necessary to actuate *both* windlasses on the car, in order to apply all the brakes. (p. 477, q. 7; p. 479, q. 34.)

He says: "There were brakes on each end of the car, applied *separately* to each truck." (p. 479, q. 7.)

The testimony of this gentleman (and to show that he *was* a gentleman, we call attention to the excellent tone of his answers on cross-examination: p. 480, x-q. 9 to 26) is indeed negative testimony, in that it is sufficient of itself to negative the whole Tyler car defense; but the *manner* in which it does so is remarkably *positive*.

The learned counsel can say only two things against Quigley's testimony:

1st. He says that his testimony would at once be received as true, if it were not contradicted by at least *twenty* witnesses for the appellant, every one of whom is at least as good as he. (p. 50.) We have already seen, however, that the appellant has, all told, but *thirteen* material witnesses who did not *retract*. Of those, five (viz., Thompson, Stockham, Smith, Venable, and Dunn) only claim to have seen the brake *once* or twice, and that casually, while the car was in the shop being overhauled, as most of them say, in the winter of 1844–45; but which overhauling Thompson himself shows did not occur till several years afterward, and long after our invention was made.

The learned counsel evidently does not mean *that* set of men, when comparing his witnesses with Quigley.

Neither can he mean Lockwood, Talson, or Dripps; for, unlike Quigley, they had often told people precisely the reverse of that to which they now swear. Nor could he have intended to refer to J. C. Hillman; for *he* is contradicted by an obvious *fact*, which he forgot to take into account when making up his story.

Nor can he refer to Head or Buzby; for they never were either train men or mechanics, and the former is contradicted by ten witnesses on an important collateral point, and the latter only claims to have noticed the brake *once* during his monotonous service of 27 years on the road as time-keeper and clerk. Nor can he refer to Conover; for even the learned counsel himself can indorse him no further than to say he was *presumably* honest. (p. 37.) He *must* refer to the only two remaining men, B. L. Wallcott and Bogy. They were the only two *brakemen* out of the whole faithful thirteen of the appellant.

Bogy (who signed his deposition with a X) can only say (p. 267, q. 5) that he observed the double brake "along" in 1844 and 1845.

B. L. Wallcott could remember nothing about the brake till he had time to "study on it a little." (p. 218, x-q. 38.)

We submit to the court, however, whether Quigley is not more *definite* than *Bogy*, and call attention to the fact that he was not "seen," as *Wallcott* was.

It appears that at the time the Lockwood-Talson Tyler car conspiracy was sweeping into its ranks the simple-minded and dependent mechanics and clerks on the Camden and Amboy Road, it came to the ears of the appellee that there was an engineer by the name of Quigley who had declined to "remember" that the Tanner brake was on the Tyler car a few years *before* our invention, instead of a few years *after*. Knowing his own methods, however, the agent for the appellant (Mr. Whipple) naturally supposed that Quigley had been "seen" by Mr. Sayles. Accordingly, when all other means of scathing him on cross-examination failed, the following dialogue took place (p. 483):

"X-Q. 58. Who first called your attention to testifying in this case?

"A. I was subpœnaed to do so.

"X-Q. 59. By whom?

"A. By the prosecutor.

"X-Q. 60. Who is the prosecutor?

"A. This gentleman who sits here at the corner of the table. I do not remember his name.

"X-Q. 61. Did Mr. Sayles, who sits at the corner of this table, serve the subpæna upon you? If not, who did?

"A. He sent it to me by mail.

"X-Q. 62. Have you had conversation, with regard to your evidence in this case, with any person or persons before you came into this room?

"A. Nothing further than on the road among our own men, about the different brakes; how they worked, &c., &c."

The appellant was so much disturbed by this testimony of a long-trusted railroad engineer, that its indefatigable agent (Mr. Whipple) made diligent search for material with which to contradict him on some one or more of the collateral matters to which he testified with great freedom, in a deposition composed of 41 direct and 72 cross questions and answers. Not a flaw or inconsistency could, however, be discovered, as is substantially confessed by the learned counsel, who refrains wholly from referring to the fact, that the appellant's agent (Mr. Whipple) took pains to prove, that whereas Mr. Quigley said in his deposition he was 43 years old, one Peter Bloomsburg, whom "common report" had it, was Quigley's "uncle by marriage," had told one Burgby that Quigley's age was 41!

We have selected this deposition for analysis, rather than some other, chiefly because Mr. Quigley is the witness whom the appellant made the most strenuous efforts to break down.

In view of the law that a defense of want of novelty must, when set up against a patent, to be successful, be proven *beyond a reasonable doubt*, as distinguished from a mere *preponderance of evidence*, we claim that the Tyler car defense falls *of its own weight*. We have shown that it carries *within* it the dynamite that must blow it to fragments.

We have not, however, refrained from proving the *contrary* of what the appellant *alleges*, but has *not*, and could not *prove*. Quigley's deposition is a sample of our testimony, more indisputable than the average it is true, but still a sample. It is unnecessary for us to analyze it all. We will simply classify it, remarking that the learned counsel, in reviewing our depositions, includes several of such a collateral character that we never once thought of mentioning them in our brief, and takes evident delight in showing that not *all* of the thirty brakemen, firemen, conductors, and engineers whom truth compelled to testify in our behalf, are as positive, circumstantial, and unassailable as Mr. Quigley. In addition to him, however, there are *twenty-two admissible witnesses for the appellee*.

They are divisible into four classes, in respect of weight.

First. Four men who positively swear that no double connected brake was ever on the Tyler car till about 1850. They are Condit, (p. 437, q. 13,) Hutton, (p. 388, q. 22, 23, and 24,) Pancoast, (p. 601, q. 2, 3, and 4,) and Van Syckel (p. 506, q. 11 to 15.)

Second. Four men who say that they were acquainted with the Tyler car from 1843 till 1850, and that, to the "best of their knowledge," it had nothing but a single acting brake upon it during those years. They are Morris, (p. 391, q. 17, 18, and 19,) Crim, (p. 601, q. 9,) Seeds, (p. 603, q. 4,) and Seward (p. 563, q. 7.)

Third. Seven men who had ample opportunity and reason for seeing the double brake if it had been on *any* car of the Camden and Amboy Road at any time during those years, and did not see it. They are McFarland, (p. 469,) O'Mahoney, (p. 432,) Reid, (p. 416,) Van Houten, (p. 525,) Ward, (p. 425,) Briggs, (p. 533,) and Frisbee (p. 552.)

Fourth. Seven men who were each acquainted with the Tyler car for various lengths of time, ranging from two to five years, between 1843 and 1850, and all of whom testify positively that there was no double brake on it during those periods. Herbert's acquaintance was from 1843 to 1845. All other portions of the time are covered by at least two out of the remaining six, and from 1846 to 1850 by at least three.

The names of the seven witnesses are Herbert, (p. 564,) Jefferies, (p. 409,) Teese, (p. 572,) Counsellor, (p. 516,) Flannegan, (p. 556,) Nostrand, (p. 530,) and Moore (p. 443.)

GENERAL REMARKS.

First. Frequently, throughout his brief, the learned counsel quotes from an oral argument delivered in 1869, for the complainant, in the court below. By means of extracting such sentences as are suitable for the purpose, he is able to create, set up, and knock down in the course of ninety-five pages, many a man of straw.

An instance of the kind occurs in the second paragraph from the top of page 46—a paragraph which all must heartily confess is a rhetorical *gem*.

Second. The complainant, in order to break the force of the five witnesses who testify to Lockwood's previous statements contradictory to his present oath, attacks the veracity of Henry Waterman, the eminent mechanical engineer, who is also probably known to the court. The insincerity of this attack is shown, however, by the fact that the appellant itself afterwards called him as a witness on another point in the case. It hardly accords with the rule to attack the veracity of a man, and in the same breath offer him to the court as a witness, and thus indorse his veracity.

Third. For the same purpose, also, it attacks the appellee, saying: "Sayles has testified in this case over and over again, and has been contradicted every time." The record shows that he has testified but once in this case, except on this Talson-Lockwood conspiracy; and that so far from being contradicted every time, he has himself contradicted the conspirators, Talson, Lockwood, Dripps, and Cudlip, and in so doing has been *corroborated* by Samuel Blatchford, George Gifford, C. M. Keller, Thomas M. North, Wm. Wheeler Hubbell, Francis A. Stevens, Isaac P. Wendell, Thomas P. Grosvenor, David H. Baker, Mark C. Hubbard, and Henry Waterman, not one of whom had any interest in the suit, either as counsel or otherwise, and five of whom had—or had formerly—interests against the complainant's patent.

Fourth. The learned counsel also says, (p. 45,) "If our evidence is not true, we think the court will agree with us that this is one of the most extraordinary cases of wholesale perjury ever known." It is indeed *one* such case; but there is another case, in this very record, even *more* extraordinary, of which the court is now about to learn the first. The Tyler car is not the *only* conspiracy in the case in behalf of the appellant. There is another bolder, more positive, and on its *face* far stronger and more dangerous than it, viz.:

THE LONG ISLAND CONSPIRACY.

The testimony in the Long Island matter was all worked up and taken, on behalf of the appellant, by Stephen M. Whipple, the *same man* who managed the entire Tyler car and Stanley-Talson defenses, to whom, however, the learned counsel's brief contains not the most distant allusion.

The writer of this had prepared his brief on the Long Island defense before he was informed, in April last, that the honorable counsel who has charge of the case for the appellant in this court had concluded to abandon it, as unworthy of belief.

We will insert herein the analysis of the testimony that brief contained, as a further way of meeting the learned counsel's argument, that the Tyler car defense is necessarily true, because thirteen men swore to it.

Six men swore to the Long Island defense, and, unlike several of the thirteen Tyler car men, not one of them could be contradicted out of his own mouth.

The story, however, was shown to be so utterly false, that even the indefatigable counsel for the appellant, who never omits a possible point, either small or large, abandoned it, and does not even mention it in his brief.

Here follows the original analysis of the testimony on both sides, just as it was prepared for the printer, when we supposed it would have to be argued on its merits:

The record contains six depositions on each side of this question. Let us first review those on behalf of the appellant.

Van Voorhis, a street-car conductor, says he had charge of the repairs of the cars on the Long Island Road from May, 1843, till some time in 1846, and that in the summer of 1845 a brake precisely like ours was put on one of the cars of the road; and that when he returned to the same position on the road in May, 1847, he found that during his absence the same brake had been put on four more cars; and that within a year and a half thereafter he put them on *all* of the twenty passenger and three baggage cars on the road. (p. 276, q. 3 and 4, x-q. 26 to 36.)

Phillips, a carpenter, says the brake was put on the one car Van Voorhis speaks of, and also on half a dozen others, in June and July, 1845. (p. 281, q. 3, x-q. 15 and 16.)

Marshall, a track layer, says Van Voorhis attended to all the repairing of the cars on that road in 1845, and that the double brake was put on one of them in that year, and as fast as the others were repaired on them also. (p. 283, q. 3, 4, and 5.)

Ryder, formerly a conductor on the Long Island Road, says he knows the brake was put on its cars before 1847; but whether it was in 1845 or in 1846 he cannot say. (p. 301, q. 7.)

Farrell, a baggage-master on the road from 1843 to 1856, says the brake was put on his baggage car *in the shop* in 1845 or 1846. (p. 280, q. 3.)

Osman says he went on the road as brakeman in August, 1848, and continued as such till about 1861; and that when he began his labors two or three of the passenger cars had the same brake on. (p. 286.)

We will now consider the testimony for the appellee.

Leach was superintendent of the Long Island Road, and also had entire charge of its mechanical department, from 1844 till the last day of August, 1847; and he says positively that he knows of his own knowledge that there were no double-acting brakes in use on that road during that period. (p. 440, q. 7.) He shows that he gave the closest personal attention to the machinery of the road, and knew all that was being done therewith. He also shows that Van Voorhis was only a yard-master at Brooklyn, who did nothing more by way of repairs than to replace a lost bolt or releather a brake shoe, and that if any further necessity for repair came under his observation, Van Voorhis reported the fact to Leach, and the latter would cause it to be attended to at the *shop* at Jamaica, eleven miles away from Van Voorhis' *yard*. (p. 442, q. 18.) He also says that John Areson was foreman of car repairs during all the time of Leach's administration. (p. 442, q. 16 and 17.)

Areson says he was foreman of car repairs for the Long Island Road from 1840 till 1861, and says positively that there never was any double-acting brake applied on that road till he applied one of a peculiar form, unlike ours, in 1848. (p. 445, q. 8, 17.)

Frederickson says he was a blacksmith in the car shops of the road from 1845 till about 1861; that Mr. Areson put on his brake about the latter part of 1847 or 1848; (p. 447, q. 6 and 7;) that he often had to overhaul the trucks, and therefore had every opportunity to see the brakes; and that he is *positive* that Areson's brake was the first double-acting brake he ever saw. (p. 448, q. 16.)

Chapman says he worked at the Jamaica shop, under Areson, from 1846, for several years; that he had a hand in the repairing of almost every car that was repaired, (p. 446, q. 9,) and that he never saw a double brake till Areson put his on, after Leach left. (p. 446, q. 6, 7, 12.)

Mitchell says he began work for the road about 1845; that he first saw any double brake about 1848, (p. 450, q. 7 and 8,) and describes it as being Areson's brake; and that no double brakes could have been on the road prior to that without his seeing them. (p. 451, q. 15.)

Palmer was employed on the road from 1851 to 1860 in various capacities, from conductor to acting superintendent, and he says that when he went on the road all the brakes were single brakes, except two of Areson's brakes. (p. 511, q. 6.)

The witnesses for the appellant nearly all had the reckless mendacity to say that Van Voorhis, their leader, had charge of the car repairs on the road, when they must have known, as is fully explained in our testimony, that he was a mere yard-master, eleven miles away from the car shops.

It is now high time to put a period to the discussion of the Tyler car.

The counsel for the appellee, however, cannot leave the subject without remarking, that "CORRUPTION WINS NOT MORE THAN HONESTY."

ACCOUNTING.

QUESTION A. *Is it the infringer's saving or the patentee's license fee, that is the proper measure of the profits recoverable in this case?*

I speak of this as a *question*, not because it *is* such, but because the appellant's counsel *treats* it as one. A few quotations from the leading decisions of this court on the subject will suffice to show, that if it ever *was* a question, it is such no longer.

In Mowry *v.* Whitney, 14 Wall., 620, (1870,) Mr. Justice STRONG, delivering the unanimous opinion of the court, laid down a rule which has since become almost as celebrated in the Patent Law as the rule in Shelly's case became in common law. It is as follows:

"The question is, what advantage did the defendant derive from using the complainant's invention, over what he had in using other processes then open to the public, and adequate to enable him to obtain an equally beneficial result? The fruits of that advantage are his profits."

In Burdell *v.* Denig, 92 U. S., 720, (1874,) Mr. Justice MILLER, delivering the unanimous opinion of the court, announced the doctrine, that the profits recoverable, according to the rule in Mowry *v.* Whitney, are so recoverable, *not* because they are a measure of the complainant's damages, (which was also established as law in Seymour *v.* McCormick, 16 Howard, 489: 1857,) but on the ground that the infringer is the complainant's *trustee* while making those profits. Justice Miller says:

"In cases where profits are the proper measure, it is the profits which the *infringer* makes or ought to make which govern, not the profits which the *plaintiff* can show *he* might have made. Profits are not the primary or true criterion of damages for infringement in an action at law. That rule applies eminently and mainly to cases in equity, and is *based upon the idea* that the infringer shall be converted into a *trustee*, as to those profits, for the owner of the patent which he infringes."

In Birdsall *v.* Coolidge, 93 U. S., 68, (1876,) Mr. Justice CLIFFORD again elaborately explained and enforced the same doctrine of trusteeship.

Perhaps the learned counsel will say, as he did when arguing against the doctrine of trusteeship before Mr. Justice HARLAN, in September last, that the court did not mean what it said in Burdell *v.* Denig and Birdsall *v.* Coolidge, but was merely indulging in metaphorical *dicta*. In deciding the cases then under consideration, however, Mr. Justice HARLAN used the following language, in an oral opinion taken down by a stenographer:

"I am convinced that it is settled law, determined by the weight of authority, that, independent of those cases where the account may be had on the ground of the injunction, the jurisdiction is now entertained in the Chancery Court on the ground that the party violating the patent is a *trustee*, and holds whatever profits he has made in trust for the patentee."

In The City of Elizabeth *v.* The American Nicholson Pavement Company, (1878,) 97 U. S., Mr. Justice BRADLEY delivered the unanimous opinion of this court, saying: "It is clear that a patentee is entitled to recover the profits that have been actually realized from the use of his invention, although, from other causes, the general business of the defendant in which the invention is employed may not have resulted in profits; as, where it is shown that the use of his invenproduced a definite *saving*."

These decisions dispose of the thirteenth assignment of error, and of the argument intended to enforce it, which begins with the last paragraph of page 91 of the appellant's brief, and extends to the end of the learned counsel's argument.

QUESTION B. *Was it the single brake or the Springfield brake that the master should have adopted as the standard of comparison, when proceeding, as he did, to assess profits under the rule in Mowry* v. *Whitney?*

In arriving at his conclusions, the master adopted the single brake as the standard of comparison, rejecting the Springfield brake, which the respondent insisted was the true one for the purpose in view. To justify his report in this regard, the master says that it appeared to him, from the testimony, that "the Springfield brake was an unsuccessful, abandoned experiment, and not a perfected, practical invention, and that it is a defective brake, and not adapted to ordinary every-day use on passenger trains." (pp. 36, 37.) The first three exceptions bring this finding to the attention of the court, and insist that the master was wrong therein, because the facts upon which he based his conclusion are claimed to be disputed by forty-two witnesses named in the exceptions.

Our present inquiry, therefore, is as to whether or not the Springfield brake was the proper standard of comparison, within the meaning of the rule in Mowry *v.* Whitney. The appellant can find no fault with the master in this regard, unless it shows that the Springfield brake was a more beneficial brake than the single brake; and here the burden is on *it*, and not on us, to show the contrary, because the master's report must stand, unless shown by the respondent to be positively erroneous.

SPRINGFIELD BRAKE OF 1843.

This brake was contrived by Ephraim Harris, then foreman on the Western Railroad of Massachusetts, and put by him upon two "crate" cars thereon.

He did not even *intend* it to be a *double* brake,—*i. e.*, one applying all the shoes at the same time from either end of the car,—but merely as a *double connected* brake, so arranged, that if one connection gave way the other would thereupon operate as its substitute. (Harris' deposition, p. 87, line 14.)

The accident that gave rise to it (p. 86, q. 3) did not, however, occur again during the short time it was in use, (p. 88, q. 3,) and as, for the general purposes of a brake, it proved to be inferior to the single brake, (p. 87, line 29,) it was abandoned, and the single brake put upon the two crate cars in its stead. (p. 88, q. 6.)

The *reasons* why the Springfield brake could not operate as a *double* brake, are set forth in the deposition of the expert Cooper. (p. 107, q. 10.)

Two or three of the respondent's witnesses attempt to say that Harris is mistaken as to his own intention in contriving the brake, and pretend to think that it did apply all the brake shoes simultaneously from either end of the car. One of them says (p. 146, line 5) he *understands* such to be the case, and another says (p. 1039, line 11) that he never heard that such was *not* the case. Harris, who had every reason to *know* whereof he affirmed, must of course outweigh any number of witnesses of this sort.

The Springfield Brake of 1856.

Being well aware that the facts about the experiment of 1843 are as I have stated, the respondent proceeded to prove (Stebbins, p. 1049) that the Springfield brake was again used in 1856, on car number 2 of the Western Railroad, and on twenty-two or twenty-four so-called "line" cars running over the various roads between New York and Boston, via Hartford and Springfield.

Stebbins says that he never operated the brake himself, except in switching; that he called it a good brake when in order; that it was no more liable to get out of order than any other; that it was abandoned after running sixteen months on the "line" cars, and two or three years on car 22, and the single brake substituted on the latter; and that the brake in general use on the Western Road, from its beginning to 1862, was the single brake.

How significant is this statement of the respondent's own witness. It is alone ample proof that the Springfield brake is not better than the single, for it had its birth on this very road nineteen years before, and was well remembered by Eddy (who succeeded Harris as master mechanic) all the time, (Eddy's deposition, p. 1040,) but never was thought highly enough of to permanently take the place of the single brake on one solitary car on that road.

Inasmuch as Stebbins' deposition refers only to these "line" cars and to car 2, it is fair to suppose that the respondent intended to go into those matters fully enough to show the successful working of the Springfield brake on those cars. It appears, however, that the indefatigable Mr. Whipple, its agent, was never able to find anybody else who would say that the brake was a success in those years; for no corroborating testimony is to be found in the record.

The complainant, however, with his customary thoroughness, took the testimony of thirteen witnesses, who say that, as used on those "line" cars, the Springfield brake was not so efficient as the single brake. They are Moran, (p. 668, q.

20,) Harding, (p. 675, q. 10,) Fenner, (p. 671, q. 12, x-q. 32, 37,) Pierce, (p. 680, q. 7,) Parker, (p. 683, q. 10–13,) Witherbee, (p. 685, q. 14,) Wallace, (p. 730, q. 5,) Dade, (p. 759, q. 6,) Fuller, (p. 765, q. 7,) Rand, (p. 766, q. 9,) Blessing, (who also testifies to a serious accident caused by the brake: p. 768, q. 11–18,) Charts, (who also was present at the accident: p. 822, q. 8 to 9,) and Wadleigh, (who testifies to still another serious accident caused by the brake: p. 827, q. 8–17.) The complainant also took the testimony of the car inspectors at each end of the line, both of whom say that great pains were taken to keep the brake accurately adjusted. (See Rood's deposition, p. 829, q. 5; and Hutchings', p. 832, q. 6 to 16.) Stebbins also says that *he* adjusted them at Springfield. (p. 831, x-q. 2 to 4.) No statement can, therefore, be made that the brake failed on the "line" cars because it was not well cared for.

THE SPRINGFIELD BRAKE OF 1872.

Painfully aware that the history of the Springfield brake, in 1843 and 1856, would utterly fail to make it available as a standard of comparison on the accounting in this case, the respondent, in 1871–2, caused a series of experiments to be made with it on six different railroads in New England, hoping that with extraordinary *care* the brake could be made at least to *appear* to operate as a double brake. I will, however, show that none of these experiments proved it to be any better than the single brake.

The Boston and Lowell Experiment.

The brake was applied to four cars on that road in January, 1872, (p. 1060, q. 8,) and remained in use till just after a certain special trial of a week to which they were put. (p. 733, q. 42.) It appears, from respondent's witness, Blood, (p. 1064,) that those four cars were mixed on the same train with one or more having the Hodge brake, and that for six days he noted the time occupied in stopping the train at the various stations. The net result of those exact-looking columns of figures he says he then set down, is, that the time occupied in stopping the train varied from 25 to 120 seconds. No other fact of any sort of interest is proven by the respondent with regard to the Boston and Lowell experiment. That this fact is utterly inconsequential, appears from the following circumstances:

1st. It don't appear anywhere in this case that the single brake would not have stopped the train as quickly, with the same number of brakemen. 2d. It *does* appear, from the testimony of Flagg, a locomotive engineer of 18 years' experience, that the *maximum* time required to stop such a train with a good double brake is 30 seconds, (p. 739, q. 3,) that being quicker than any of the 192 stops made with the experimental train, save two, 3d. Blood subjects his fairness in timing these stops to grave suspicion, by saying that he merely took the time for his own information, not expecting to use it again, (p. 1065, q. 26,)—inasmuch as Brigham, another employee of the road, says (p. 732, q. 23 to 34) that special pains were taken to put a conductor and a depot master to braking on that occasion, on account of their former experience and well-known efficiency therein, and that it was understood that the trial was made for the express purpose of being proven.

The complainant, however, refrained not from removing even the *pretense* of proof that the Springfield brake operated well on that road, by taking the testimony of Copithorn, Hillock, and McAlister, the men who put on the brakes and tried to keep them adjusted, under Mr. Whipple's directions. All of these men say that, despite every effort, the brakes could not be made to work properly. McAlister says, (p. 748, q. 27,) "I think they are a very poor thing." Copithorn says (p. 834, q. 19 to 21) that the brakemen constantly complained that they would not hold the train, and that it was impossible to make them work on all the wheels alike. Hillock says (p. 843, q. 13) that the brakes held on *one* truck but not on the other; thus agreeing with our theory, that at best the Springfield brake operates only as a single brake on one end of the car.

The Providence and Worcester Experiment.

O. L. Smith testified, for the respondent, (p. 1094,) that the Springfield brake was put on a car of the above road, for trial, December 22, 1872, and taken off February 22, 1873. No attempt is made by the respondent to prove that it operated successfully, which is perhaps a sufficient indication that it did not. The complainant, however, took the testimony of four of the railroad employees, who say that the brake was an entire failure on that occasion, (see Gates, p. 648, q. 9; Crocker, p. 650, q. 9; Oliver A. Lockwood, p. 658, q. 4; Mowry, p. 665, q. 3,) and that it was precisely because of this failure that the use of it was discontinued. (See Gates, p. 649, q. 11.) Three of these same witnesses also testify that the Tanner brake, put on another car of the same road at the same time in an imperfect form, and afterwards put on more perfectly under Mr. Sayles' direction, worked exceedingly well. (See p. 649, q. 14; p. 650, q. 10 to 13; p. 665, q. 5.) With reference to the excellence of the Tanner brake as used at this time, two others speak who did not use the Springfield. They are Thomas (p. 657, q. 10) and Lynch (p. 655, q. 10 and 14.) The circumstances were very disagreeable to Mr. Whipple, as might well be supposed, and he gave vent to his views as to the fatal character of their meaning, in an interview with Charles H. Smith, the clerk of the master car builder of the road. (See p. 647, q. 4.) It seems, however, that his spirits afterwards partly revived; for we find that some weeks after he caused some contrivances, claimed to represent the Tanner, Hodge, and Springfield brakes, to be constructed, and attempted to show, by means of scales inserted at various points therein, the amount of force exerted on sundry of the rods. He had two witnesses present at these experiments, and afterwards took them both to Boston to swear to the result. One of them did so to his satisfaction; but the other, O. L. Smith, on being requested by him to change his notes of the experiment with the Springfield brake from 32 pounds to 24 pounds, and swear to the latter as the truth, declined to do so, notwithstanding Mr. Whipple told him that if he did not it would "knock" or "spoil" the experiment. (p. 837, q. 22.)

This tribunal will hardly look with favor upon such a method of manufacturing evidence as that which failed with Mr. Smith, however much it succeeded with Mr. Birney.

The Boston and Providence Experiment.

The Springfield brake was put on two cars of this road, under Mr. Whipple's direction, in the winter of 1872-73, (p. 1051, q. 8 to 10,) and two witnesses—one conductor (Lincoln) and one brakeman (Rogers)—were found to swear that it operated well. Lang, the car inspector, however, says that there were constant complaints about its *not* working well; (p. 724, q. 13;) and that Rogers himself, after his return from Springfield, where he swore they worked so excellently, came to him and requested them to be taken off, *inasmuch as there was no further use for them, the testimony having been taken.* (p. 729, x-q. 40, q. 33 to 38.) They were accordingly removed. (See Lang's deposition for respondent, p. 1166, q. 15. See, also, Lang's correction of *another* statement in this deposition, on p. 831.) The alacrity with which the Springfield brake was in every case dispensed with, immediately after the testimony to support its superiority was taken, is significant of the true character of the brake and of these experiments.

The Hartford, Providence and Fishkill Experiment.

The Springfield brake was applied to one car on this road in February, 1872, (p. 1098, q. 4,) and taken off the following July.

One deposition only is found in the record referring to this experiment, that of Perry, who admits he never saw the brake operated but on one occasion. (p. 1098, q. 12.) He says also that a Mr. Lewis, a brakeman, had more to do with it than anybody else; (q. 14;) and it appears from question 24, (p. 1100,)put to him by Mr. Whipple, that this Mr. Lewis' deposition had already been taken. As, however, it is not in the record, the conclusion is, that it did not suit Mr. Whipple, and was therefore suppressed by him.

There was, of course, no need for the complainant to rebut such evidence, and he did not take pains to do so.

The Connecticut River Railroad Experiment.

The Springfield brake was put on four cars of this road, and run in a certain local train known as "Sampson's train," for a few months in 1872—sometimes alone, and sometimes with a car with a Hodge, and at other times one with a Tanner brake in the same train. The respondent took the testimony of four witnesses—Hitchcock, Wright, McCormick, and Sampson—as to their opinion of the result. McCormick says that the Springfield is better than the Hodge, (p. 1092, x-q. 6,) and Hitchcock says the Hodge is better than the Stevens. (p. 1077, x-q. 1.) If these two witnesses are not in error, then the railroad companies throughout the United States *have* been in gross darkness for twenty years; for they have persisted in using the Hodge and Stevens brakes, though the Springfield brake was open to them all the time. Those of them that try the Springfield brake also show perverse folly in abandoning it at the very first opportunity.

None of the four, however, had any but the very loosest methods of comparing the efficiency of the brake with that of any other. The experiment, therefore, furnishes no evidence whatever that it operated any better than the single brake would have done under the same circumstances. Indeed, Hitchcock admits (p. 1080, x-q. 29 to 31) that "kinking" and "spiraling" *did* occur on those cars; and of course kinking and spiraling practically resolve the Springfield brake into the single brake.

He also admits a fact he carefully concealed till 153 questions had been put to him—that the Springfield brake had already been removed from three of the four cars it had been put on six months before. This inconsequential, contradictory, and absurd testimony was not dignified by the complainant with any rebuttal. It fell because of its own weight.

The Boston and Albany Experiment.

This was more elaborate than any of the others. Car 123 was fitted with a form of the Tanner brake, modified by connecting the rods G^2 and H^2 to the *ends* of the center lever, instead of at points half-way between the ends and the pin B, and without *increasing* the leverage in the truck to correspond with the *decrease* in the center lever. The result of such a change was of course to reduce the power applied to each wheel just one-half. Car 124 was fitted up with the Springfield brake. The two cars were put on the road about the same time, and run in the same train, with a view to seeing which brake wore the most iron from the brake shoes under the same circumstances. The result (shown, however, without much regard to the rules of evidence) made it appear that the Springfield brake wore away 81 pounds, and the modified Tanner 80 pounds of iron, in eight weeks of use. (p. 970, q. 60.) Great reliance is placed on this substantially uniform outcome, as the foundation for the argument that the Springfield brake is as efficient as the Tanner for the purpose of retarding a train. The fatal error in the experiment lies in the fact that the Tanner brake was so constructed for the purpose of the experiment as to have only one-half the power it is perfectly well able to exert without sliding wheels. It, indeed, had as much power as the Springfield had on the same trial; but one substantial difference between the two brakes consists in the very fact that the Tanner is capable of exerting *double* the power without sliding the wheels, that the Springfield can without sliding them.

All the experts on both sides agree that it is a scientific law that friction is proportionate in its power to the *pressure* with which surfaces are forced together, without regard either to the *extent* of those surfaces or the *velocity* with which they are moved over each other. This being true, it is certain that 4,000 pounds of pressure will create as much retardation of a car, when applied to four wheels of a car as to eight, *provided* none of the wheels cease revolving. It is, however, equally clear, that eight wheels under a car will *bear* an *aggregate* pressure, without ceasing to revolve, *twice* as great as four of those wheels can.

Now, apply these two facts to the experiment under review. Suppose that the amount of force applied to the windlass, in the case of both brakes, was 600 pounds, that being in fact about the average amount applied to a 16-inch wheel by a brakeman.

In the Tanner brake, as modified for this experiment, 300 pounds would be transmitted to the top of *each* truck lever, and 6,000 pounds to the eight wheels of the car. In the Springfield brake, the force transmitted to the top of *one* truck lever (on our theory, that the shoes of the other truck cannot come in contact with the wheels) would be 600 pounds; and the amount applied to the four wheels of that one truck would be 6,000 pounds. Now, as the latter amount of pressure is not enough to make any of the four wheels cease to revolve, it follows, from the law of mechanics above stated, that the same total friction is applied to the four wheels in the Springfield as to the eight in the Tanner, with the result of wearing away the same total amount of metal and exerting the same total retarding power on the car. If, however, the Tanner brake had not been modified for the purpose of this experiment, and 600 pounds had been applied to its windlass, 600 pounds instead of 300 would have reached the top of each truck lever, and 12,000 pounds instead of 6,000 been applied to the eight wheels of the car. The pressure on each wheel would have been the same as on each wheel of the one truck of the Springfield that had any pressure at all; but the *aggregate* pressure on the whole car would have been just twice as great, and, consequently, the retarding effect twice as great. No such doubling of aggregate pressure can, however, be practiced with the Springfield brake; for if it was, the wheels of its one retarded truck would be subjected to 12,000 pounds, causing part or all of them to slide, which would at once violate what all admit is the first principle of successful retardation of railroad cars. It clearly appears, therefore, that this very plausible experiment has no tendency whatever to prove that the Springfield brake is other or better in practical operation than the single brake.

We are indebted to the respondent for having made and proved an experiment on the Connecticut River Railroad that corroborates this explanation with singular exactness. Hitchcock testifies (p. 1075, q. 46) a trial was made in stopping a car having a modified Tanner brake, (*i. e.*, one with the power reduced one-half,) with the result of ascertaining that the car was retarded substantially to the same extent, whether all the power of the brakeman was applied to eight wheels or to four, the latter being done by unhooking one of the truck levers from the center lever. Stearns, (p. 1087, q. 3,) Clancy, (p. 1087, q. 2,) and Carrigan (p. 1088, q. 6 all corroborate Hitchcock. This experiment is evidently much relied upon as proof positive that the single brake is just as good as the double; and so, indeed, it is, if the *aggregate* amount of pressure needed on the whole of the car can be applied to four of them without sliding. In this experiment, the brakeman applied insufficient strength to slide even four wheels. If, however, as is the case in all practical railroading, it is necessary to apply the greatest possible *aggregate* amount of force to all the wheels of the car, it is obvious that the use of the Tanner brake results in a total pressure twice as great as the single, and is therefore twice as efficient as it.

There is an entire lack of agreement among the employees of the Boston and Albany Road as to the practical efficiency of the Springfield brake during this experimental use of it in 1872. Five of them—Braman, (p. 651, q. 9 to 13,) Wood, (p. 672, q. 14 to 16,) Gardner, (p. 690, q. 19 to 24,) O'Brien, (p. 699, q. 8,) and Churchill (p. 761, q. 5 and 6)—speak very disparagingly of it indeed; and one of the principal of the respondent's witnesses (Taylor, p. 1030, q. 34) says that "perhaps the company would not like to have him speak his mind about the brakes," and that if he did he might be discharged. This statement very significantly accounts for the conduct of the employees who undertake to say that, in their opinion, the Springfield brake is as efficient as the Hodge.

Nothing could be more absurd than these last statements; for it appears from the testimony of the respondent's own witness, F. D. Adams, that (p. 974, q. 111) the proportions of the Hodge brake are such, as used on the Boston and Albany Road, that an aggregate pressure of nearly 12,000 pounds is spread over its eight wheels when 600 pounds is applied to the windlass; whereas 800 pounds applied to the windlass of the Springfield results in a *confessedly unequal* application of only 8,000 pounds to its eight wheels,—or, as *we have proven*, to four of its wheels only. Moreover, the "spiraling" and "kinking" of chains which occurs in all brakes, but which does no harm in any save the Springfield and Millholland, was a defect which alone makes the Springfield brake incapable of acting as a double brake. (See Parker, p. 683, q. 12, 13, 15.)

It appears, at page 847 of the record, question 1, that the Springfield brakes on this road were *also* abandoned soon after the respondent's testimony with regard to them was taken, since which abandonment it will not be claimed, on the other side, that one solitary Springfield brake has been attempted to be used anywhere in the world.

The Tender Brake.

The thirteenth exception brings the "tender brake" to the attention of the court as an alleged proper standard of comparison. As, however, it is open to the same objection as the Springfield brake, it could not possibly work on a passenger car any *better* than it, and must therefore share the fate of the latter, as an attempted and fanciful means of cutting down the recovery in this case. It has never in the world been attempted to be used on a passenger car; and if it should be, it could not possibly be operated from both ends, and no more efficiently from one end than the Springfield from either. It is true, it has been used over thirty years on tenders; but thirty thousand years of such use could have no tendency to adapt it to the totally different conditions of a passenger car.

QUESTION C. *How much did the defendant save on brakemen's wages, by means of the use of our invention, during the time sued upon?*

The master reported that the defendant was enabled, by the use of our patent, to dispense with the services of twenty brakemen, whom he finds it would have been obliged to employ if it had used the single brake on its passenger and other double-brake cars during the five years in which the infringement took place. He reports the resulting saving to amount to $41,280.

The fourth exception dissents from this finding, on the ground that the master therein *assumed*, that with the single brake the defendant would have been compelled to employ *double* the number of brakemen and baggagemen, in the management of its trains, that it did employ with the double brake.

The ninth assignment of error raises the same objection; and the eighth alleges that the court erred in finding *any* saving of brakemen.

Candor compels the appellee to admit that the *ninth* assignment is well founded, but he insists that the *eighth* cannot be sustained.

We admit that the master erred in finding a saving of two brakemen on the "mixed train" of the defendant, because it does not appear that with the single brake the conductor would not have been able, and would not have been called upon, to operate one of the additional windlasses that in such a case would have been required to be actuated; nor that the freight car brakemen could not, without interfering with their duties on the freight cars which composed part of the train, have actuated the other.

We also admit that the master erred in finding a saving of two brakemen on the "caboose cars" of the defendant, because it does not appear in the record that with the single brake the conductor would not have been able, and called upon to actuate the additional windlass required in that case to be operated, and because it does not appear that the defendant's freight-car brakemen were not sufficient in number to actuate two single brakes on the caboose cars, without interfering with their duties on the freight cars themselves.

We are compelled further to admit that the master erred in finding a saving of 16 brakemen on the four passenger trains of the defendant, because it appears that they *actually employed* 16 such men, and that with the *single* brake they would have required only 28, and not 32, as the master found. It follows, therefore, when the record is critically scanned, that the master should have reported a saving of 12 brakemen, instead of 20; and a saving of brakemen's wages of $24,768, instead of $41,280.

The testimony upon which his report is based was taken prior to 1873, when the rule in Mowry *v.* Whitney was yet new, and unapplied to any large variety of cases. The report is founded on certain theories of saving which seemed to be very strong at the time the report was made, but which subsequent decisions of the courts have determined to be rather too speculative to furnish the foundation of money decrees.

We therefore frankly admit, that, in the light of the law as it now is, the record furnishes no sufficient foundation for any decree on account of the saving of brakemen's wages greater than $24,768. That it does furnish an ample and strict foundation for *that* amount, we will now proceed to show.

First. It is stipulated, on page 849, that from June 2, 1859, until June 2, 1864, the defendant used the double brake on all the cars of four passenger trains per day, which trains had six cars each, on an average.

Second. It is stipulated, on page 850, that during this time the defendant employed 12 regular brakemen, besides the baggagemen, (which last appear from the other stipulation to be four in number,) who also acted as brakemen, making 4 such men on each train, or 16 in all.

Third. It is evident that each of these four sets of men were sufficient, with the *double brake*, to apply the brakes to all the wheels of the train upon which they were employed, with one to *spare*. It is possible this extra man *might* have been dispensed with, in which case the saving derived from our brake would have been increased; but as he was *not* dispensed with, we are not entitled to any recovery on that account.

Fourth. Thomas Hull, the master of the defendant's car department, and the defendant's own witness, says, (p. 959, x-q. 1,) "I consider it necessary to apply the brakes to all the wheels of a passenger train when stopping at stations, or in case of obstructions on the track, or in case of accidents to the train, for the safety of the passengers and train." Dunlap, the superintendent of the defendant's road during the time of the infringement, and who was also called by the defendant, says, (p. 964, x-q. 3,) "I did not employ more brakemen on the passenger trains during that period than I considered necessary for the safety of the trains and passengers."

It follows, from these two depositions, that the defendant was compelled by *the necessity of the case* to apply the brakes to all the wheels of its cars, on its passenger trains, with *at least* that degree of simultaneousness which three brakemen with the double brake can exert.

Fifth. That the defendant would have been compelled by the *same necessity* to employ 7 men to operate the brakes on each of its passenger trains, if it had used the *single* brake thereon, is very obvious, and, moreover, is sworn to by the defendant's own witness, Hull. (p. 960, x-q. 3.)

It positively follows, from the foregoing five points, that whereas with the double brake the defendant neither employed nor needed to employ more than 4 men to operate the brakes on each of its four passenger trains, or 16 in all, it would have been *compelled* to employ at least 7 men for that purpose, or 28 in all, if it had used the single brake thereon.

A clear saving of 12 brakemen's wages is thus *proven, by the strictest rules of evidence of which the nature of the case admits*, to have been constantly derived by the defendant from the use of our patent during the five years covered by the infringement.

It being stipulated, on page 849, that the defendant paid its brakemen an average of $34.40 per month during the period of the infringement, a short calculation will show that the aggregate saving during the five years was $24,768. Thus: $34.40 × 12 (the number of brakemen) = $412.80; and × 12 (the months in a year) = $4,953.60; and × 5 (the number of years) = $24,768. Or the same result may be arrived at from the master's report, thus: 20 : $41,280 : : 12 : $24,768.

Most of the appellant's objections to the master's report, as to saving of brakemen's wages, apply only to its *excess* over a saving of the wages of 12 such men. As far as its objections apply to a saving of *that* number, we will now proceed to show that they are not tenable.

First. It is not *true* that the defendant continued to use precisely the same number of brakemen on its passenger trains, with the double, as it formerly did with the single brake, for the simple reason that *it never used the single brake on its passenger trains at all.* The language the learned counsel puts into the mouth of Garvin cannot possibly be deduced from his deposition. Garvin says that the defendant used both the single and double brakes, (p. 962, q. 3,) but he don't say it used ~~double~~ single brakes on its *passenger* trains; and if he did, the court would not accept it, for it is expressly stipulated, on page 849, that the defendant came into existence and commenced running cars June 2, 1859; and that from that time forth it used the double brakes on *all* of its passenger trains, to wit, on 36 eight-wheeled cars running in its passenger trains, including *all* its passenger, baggage, and express cars.

Mr. Payson's statement, near the bottom of page 85, that this stipulation refers only to a small part of the defendant's road, is an entire error. The whole of the defendant's road, as it existed prior to June 2, 1864, was included in the suit. The other parts of the present road of the defendant were acquired June 2, 1864; (p. 850, line 3;) but it will not be pretended that the defendant has used single brakes on passenger cars since then.

Mr. Payson is *literally* right in saying that Garvin's is the only *evidence* on the subject. The stipulation, however, was made for the express purpose of dispensing with evidence, and cannot be disregarded in a fair review of the record. That part of the argument beginning near the bottom of page 82 and ending with line 13 of page 84, is all based on this error of fact.

The allusion therein to the experiments of November, 1871, has been heretofore shown to be fallacious; but we again call attention to the fact, that in that experiment the Tanner brake was deprived of half its leverage, so that it was capable of applying no more aggregate pressure to 8 wheels than the single did to 4, and as this amount was not sufficient to cause any even of the 4 wheels to slide, its retarding force was no greater when spread over 8 wheels, in accordance with the well-known and frequently sworn to law of friction, to wit: that friction is proportioned to aggregate pressure, and not to extent of surfaces in contact. If the Tanner brake had been given the total leverage represented in the patent, it would, without sliding any wheels, have applied double the pressure it did; and would, therefore, have stopped the train much sooner for that reason.

Second. The learned counsel seeks to rebut our positive proof that the defendant found it necessary to have brakemen enough to apply the brakes to all the wheels of the cars in its passenger trains, by saying that no road ever *did* that thing when using the single brakes.

We are curious to know how the learned counsel found out this fact, which he so positively states. The record does not disclose it. It is *such* a negative proposition as cannot practically be proved or known. Instead of the sworn necessity being "a coinage of the patentee's own brain," the statement that there is no such necessity is a coinage of the brain of the learned counsel.

The *record*, however, discloses the fact that the appellant itself *proved* that on the Erie road, when the single brake was used, one brakeman *was* employed on each car, (p. 930, x-q. 3, 4,) which is exactly double the proportion of brakemen that Hull, the appellant's own employee and witness, says (p. 959, x-q. 2,) is now required on a train of six cars, which was the number used on the trains of the appellant. (Stipulation, p. 849.)

We admit, however, that railroads did not *generally employ brakemen enough*, while using the single brake, to apply all the brakes to the wheels of its cars, but that fact fails to make out the counsel's conclusion, for three reasons which *are* disclosed in the record:

1. Passenger trains ran at much greater speed since this infringement began, in 1859, than they did prior to the general introduction of double brakes, which was about 1852. (p. 962, x-q. 20; p. 964, q. 5.)
2. Much heavier passenger cars have been generally used during the last twenty years or more, than those used in single-brake days. (p. 937, q. 5, 6, and 10.)
3. Passenger trains were retarded in great part by reversing the engines in the days of single brakes, a practice which went out of vogue upon the introduction of double brakes, (p. 905, q. 8 and 14; p. 909, q. 9 and 13; p. 915, q. 8 and 11; p. 919, q. 8 and 10; p. 920, q. 7, 8, and 9; p. 928, q. 18 and 29,) and which did annually cost, in *injury to the engine of a train*, far more than enough to have employed the extra brakemen which we claim the single brake would have necessitated even on the light trains of those days, if the engines had not been reversed. (p. 918, q. 8; p. 905, q. 15; p. 923, q. 8; p. 926, q. 12; p. 916, q. 15; p. 917, q. 5; p. 919, q. 16; p. 922, q. 13; p. 925, q. 15.)

This interesting fact, about reversing engines, of which the court will find no hint in the appellant's brief, though it is sworn to in the record by perhaps twenty locomotive engineers, and disputed by nobody, very effectually disposes of the appellant's claim that it would not have employed the extra brakemen with the single brake, because it could not have *afforded* it. The truth is, it could not afford *not* to.

Third. The appellant says, (p. 86,) "But admit that the defendant never used the single brake, how is the appellee to tell how many brakemen they would have used with it?"

That is exactly the situation of affairs contemplated by the rule in Mowry *v.* Whitney, and the courts have succeeded many times, while proceeding under it, in answering such questions as that of the counsel.

The question in this case is, "How many additional brakemen would the defendant have been obliged to employ with the single brake, or do worse; *i. e.*, or suffer greater loss and expense on account of reversing its engines?" If anything can be positively proven by testimony, we have proven the number to be *at least twelve.*

Fourth. The *reason* why the air brake has not enabled the railroads to reduce the number of brakemen below the number used with the double brake, is the one the counsel partly gives, viz., that nearly or quite four men are needed on an average on a train anyhow—one as baggageman, and the others to take care of the fire and lights, call out the names of stations, assist passengers on and off the cars, and generally to help in running the train, in addition to actuating the brakes, which, even with the *air* brake, they are liable to be called upon any moment to do, by reason of the breaking or bursting of a rubber connecting tube, which, whenever it occurs, renders the air mechanism as helpless as a scuttled ship.

It is, however, not the men they *employed* that furnish the foundation for the saving we claim. On the contrary, it is the twelve extra men they did *not* employ and did not *need* for these purposes, but which they would have been obliged to employ, for the sole purpose of actuating brakes, if they had used the single brakes on their passenger trains, instead of using our patent, as they elected to do.

QUESTION D. *How much did the defendant save on wheels?*

Inasmuch as the defendant never used the single brake on passenger trains, we were compelled to go to other roads to ascertain how many sets of wheels were spotted in a year by sliding, when the single brake was used, that being the best evidence of which the nature of the case admitted. An analysis of the evidence in that regard will show the number to have been about three sets per car per year. When we went to the defendant's road to ascertain how many sets were used there with the *double* brake, it turned out that the number was substantially the *same*, as sworn to by Gunther, a car repairer on the defendant's road. (p. 860, q. 7.)

The master, however, seems to have thought the rule of recovery to be what the defendant *might* have saved,—not what he *did* save. He could, indeed, have fortified himself, to some extent, in this opinion, by quoting one or two chance expressions of this court, which seem to hint at such a doctrine, notwithstanding the point was decided the other way in the case of Livingston *v.* Woodworth, 15

Howard, 546, (1853,)—which was the first case that ever came before this tribunal in which money was sought to be recovered in *equity* for the infringement of a patent.

Whether excusable or otherwise, he made that error; and because several witnesses testified that on other roads, where the single and double brake had been used side by side, there was a saving of two sets of wheels per car per year in the use of the double brake, he concluded that the defendant *might* have saved the same amount, and so charged it up in his report.

The exceptions to the master's report which apply to this matter, are the *eighth, ninth, tenth, eleventh,* and *twelfth.* Inasmuch as neither Gunther's name nor testimony is mentioned therein,—as, according to law, it ought to have been,—it is fair to suppose that the master's attention was not called, by the respondent's then counsel, to its scope and effect. The learned counsel in this court has, however, presented it in his argument with irresistible power. We know of no answer to be made to his reasoning on that point.

It appears, therefore, that the decree, as it came from the circuit, cannot be affirmed in its entire amount. In such cases, we understand that the form of the order is not to be fixed by this court, in pursuance of any rigid rule, but only as justice and convenience may seem to require. We therefore ask, that the court below be directed to enter a decree, and issue an execution, for a *specific sum.* If the case were sent back to the master to make any calculations, no matter how simple, his report would doubtless be excepted to on the other side, and the decree of the court below affirming it appealed from, so that, five years hence, the parties would be again before this court, with precisely the same case that has already sufficiently taxed the time of your Honors.

MISCELLANIES.

This brief has thus far discussed all of the questions in the case (save infringement) that seem to be capable of reduction into any symmetrical order.

The seventh assignment of error, and the fifth, sixth, and seventh exceptions to the master's report, are, however, yet undisposed of.

The three exceptions to the report are merely three ways of stating one point, viz.: "The master erred because he allowed to the complainant all the saving accruing to the defendant from its use of to the infringing brake, ignoring its alleged superiority over the brake of the complainant."

This exact point was decided by this court at the last term, in the case of The City of Elizabeth *v.* The American Nicholson Pavement Company.

Mr. Justice Bradley, in delivering the opinion, said:

"The next assignment of error is based on the hypothesis that the profits received by the defendant were not the fruits of the use of Nicholson's invention, appears to us to be destitute of foundation. The Nicholson pavement was a complete thing, consisting of a certain combination of elements. The defendants used it. If they superadded to it the addition made to it by Brocklebank and Trainor, they failed to show that such addition contributed to the *profits realized.* The burden of proof was on them to do this."

Our case is identical with that. If the Stevens brake *is* an improvement on the Tanner, and if such improvement *has any relation to the saving of brakemen's labor*, it was incumbent on the respondent to prove both those facts; but to do so, it made no attempt.

The seventh assignment of error is in these words: "The court erred in directing the master to assess *damages* in addition to profits."

The argument the learned counsel bases on this assignment, is to be found set down as his first objection to the *final* decree. (p. 81.) As the error, if it was one, pertains wholly to the *interlocutory* decree, and as the attention of the court below was never called to it till several years after the interlocutory decree was entered, and several weeks after the master's report was confirmed by a final decree, and then only in a petition for a rehearing, (p. 45,) from the decision upon which no appeal lies, and especially as the petition itself was improperly inserted in this record, it seems to be rather remarkable that the learned counsel should present the point to your honors in his argument.

The appellee will, however, adhere to his rule, not to rest any part of this case on a *technical* foundation, and will show that no error was in fact committed. He must, however, be permitted to remark, in passing, that the incident discloses the spirit that has guided the councils of the appellant from the beginning of this suit, seventeen weary years ago. A case that is probably embodied in a larger record than most of the present occupants of the bench have ever seen brought before it; a case in which there have been four protracted arguments in the court below; a case the record of which is composed of three hundred and forty-six depositions, besides voluminous pleadings and documentary evidence; a case that involves in it all the property of an American citizen; a case that has been brought to this court as a *test* case, to determine the validity of a patent, is gravely sought to be reversed and undone, because of a harmless slip of the pen in an interlocutory decree, which was not discovered even by the appellant's counsel till more than two years after it occurred.

That decree was drawn more than a year after the passage of the act of 1870, which in terms prescribed precisely the form of decree at which the seventh assignment of error is aimed.

The counsel who drew it, however, does not seem to have realized that the case had come down to him from a former generation; and that therefore it would be claimed that the decree must conform to the law as it existed prior to 1870. It is a fact, however, that a *final decree for damages*, and an *interlocutory decree* directing a master to *assess* damages, are two very different decrees. Even where the law of 1870 is applicable, the final decree for damages by no means necessarily follows even an unexceptionable master's report that damages were proved.

In Birdsall *v.* Coolidge, 93 U. S., 68, (1876,) the law of 1870 was construed by this court to mean, *not* that the complainant is entitled to recover in equity *both* profits and damages, but only that he may have in *chancery* whichever is the *larger* of the two. This constrnction, though perhaps not very clearly suggested by the *text* of the statute, is seen, by those most familiar with the complicated and peculiar circumstances of patent litigation, to be *perfectly* just.

The decision in Birdsall *v.* Coolidge, however, has not in the least obviated the necessity for the master being directed by the interlocutory decree to *assess* both damages *and* profits; because the court cannot be informed which *is* the larger without such an assessment. The learned counsel for the appellant, however, if he carries his seventh assignment of error to its logical conclusion, will some day be seen in this court endeavoring to secure the reversal of a decree because the court below directed the master to *assess* both damages and profits; notwithstanding the decision of the Supreme Court that the complainant cannot *have* both.

If the distinguished judge who decided this case below had given us a *final* decree in money for both profits and damages, he would, indeed, have entirely mistaken and misapplied the law, whether he was proceeding under the statute of 1870, or under the law as it existed prior thereto. An *interlocutory* decree, however, which merely directed the master to *assess* both, for the *information of the court*, though not as necessary, is as harmless in the one case as in the other.

I sincerely thank your Honors for waiving the rule in my behalf, and permitting me to explain this case to the court.

ALBERT H. WALKER,
FOR THE APPELLEE.

APPENDIX.

Sixty Millions of Dollars!!

Under this startling title, the learned counsel for the appellant discusses enormous sums of money, with an ease and freedom quite overcoming to the appellee, who has always been a man of very moderate means. The argument of the learned counsel seems to be, that the infringers should not be made to pay the appellee *anything*, because they owe him so *much*.

The point is not of that *legal* character contemplated by the rules as being discussible in a Supreme Court brief, and we therefore reply to it in an *appendix*, solely for the perusal of the curious.

We will here explain what the *real* magnitude of the appellee's claims against infringers will be in the event that this court decides in his favor all the issues he has caused to be argued in the foregoing brief. And here we will not base our calculation *wholly* on assertion, as the appellant's counsel does his. We will go to the record for its foundation,—to an affidavit of the president of the defendant corporation, found on page 47.

Mr. Keep, the president, states the average number of passenger cars running on the railroads of the United States during the first fourteen years of our patent to have been 4,500, and during the last seven years 9,000, which equals an average of 6,000 for the whole twenty-one years. In the face of this affidavit from his own client, the counsel *states* the average to have been 10,000.

The counsel then says, without any authority whatever, that the freight cars on which the double brakes are used are at least equal in number to the others, and that there are 3,000 of them on one road alone. Now, it is a generally known fact, among persons conversant with such matters, that the Pennsylvania Railroad is the only one in the country that uses double brakes on freight cars to any extent, and that it is very doubtful whether that road derives any particular profit from the particular form of double brake it uses, which is unlike any now before the court. Moreover, that company recognized our claims, and purchased a license in 1855. As to *horse* cars, fairness should have prompted the statement from the counsel, that nearly all their owners in the whole country have already paid us for the right to use our patent.

The decree, as it comes here from the court below, is for $47,725, and covers 38 cars for five years, equal to 190 cars for one year, or $251.18 per car per year, and amounting to $31,647,420, instead of $60,000,000, as the *theoretical* amount due the appellee, *if* all those cars had the double brake *all* the twenty-one years, and *if* the owners thereof used the brake as profitably as the decree would indicate the present defendant did, and *if* none of them had ever paid for licenses under our patent. At the outset of his statement, therefore, the counsel is shown by the record to have nearly doubled the facts, presumably because "sixty millions of dollars" is a rounder expression, rhetorically, than "thirty millions."

Moreover, nearly all the large roads then in the country purchased the right to use our patent from Mr. Tanner prior to his assignments to the appellee, in 1854 and 1859. Some of the licenses he gave are printed on 48, 49, and 50 of the record; and all that he gave, together with the licenses and releases afterward given by the appellee, cover more than half of all the use that has been had of our patent in the United States.

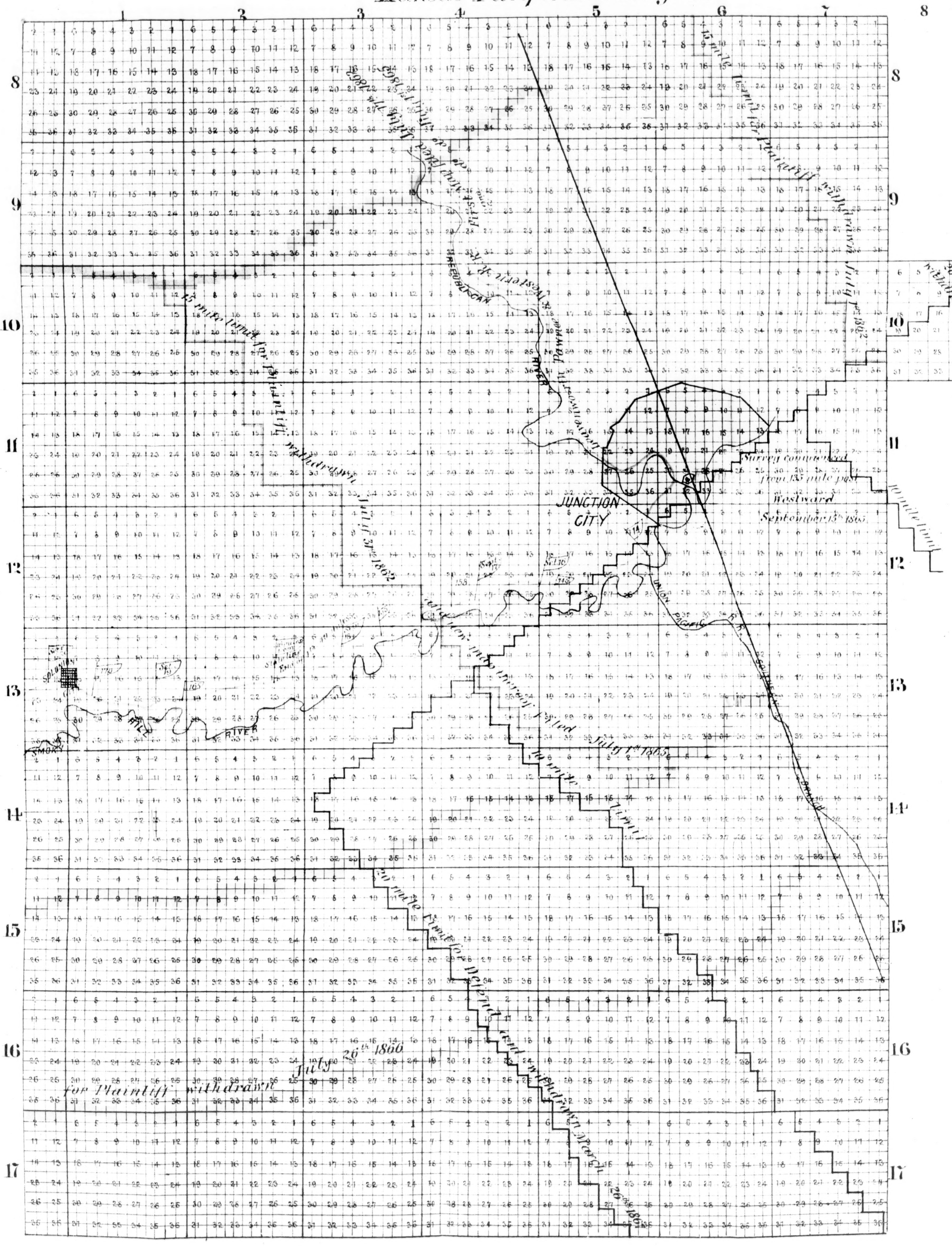
This consideration reduces the sum about which we are inquiring down to $15,000,000. This amount, however, lies almost wholly against the poorest of the infringers, and, judging from the reports of insolvencies in Poor's Railroad Manual for the last five years, at least two-thirds of the companies will never be able to respond to an execution for an unsecured debt like that owing to us. This reduces the sum to $5,000,000.

Furthermore, Mr. Justice HARLAN, a few weeks ago, decided in three of our cases, that the National Statute of Limitation of July, 1870, long ago cut off our rights of action under the *first* term of our patent, which will, if sustained by this court, reduce the amount about two-fifths more, leaving $3,000,000. We have also seen that the present decree is nearly twice as large as the evidence sustains in the now-understood state of the law, thus reducing the total *theoretical* value of the appellee's rights of action to $1,500,000, instead of the $60,000,000 the appellant so flamingly announces. This sum, however, will by no means be *collected* as a result of this court giving us such a decision as that for which we ask; because the counsel strenuously insists, that, on account of the accidental lack of the right to an injunction, equity has no jurisdiction to give us the infringer's profits at all, and that we can get nothing hereafter but such a license fee ($2,000) as we offered to take from this very defendant just before this suit was brought, seventeen years ago. That license fee would, if recovered now, give the appellant $117.64 per annum for lawyers' fees, and other expenses, while prosecuting this litigation. License fees, when paid amicably, are always cheerfully accepted by patentees; but it is *very* rare that, when collected at the end of a suit, (which in patent law is interminable,) they amount to enough to pay the expense of collecting them. If nothing but a *license fee* could be recovered in court for the infringement of a patent, infringers could infringe with impunity, for they would seldom be sued in these latter days.

The counsel also insists, in cases pending on the Circuit, that the extended term of our patent was invalid for two reasons wholly outside of any questions presented in this record. So far, therefore, from being a subject of envy, the appellee deserves sympathy and applause, for having devoted twenty-five of the best years of his life to testing the question as to whether our laws are strong enough to compel the combined railroad companies of the United States to pay over to inventors and patentees any portion of the money they have derived from pirating their property.

A. H. W.

No 325 { Missouri Kansas & Texas Railway Co.
vs.
Kansas Pacific Railway Co.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JUNCTION CITY
REPUBLICAN RIVER
SMOKY HILL RIVER
SOLOMON CITY
UNION PACIFIC R.R.
Fort Riley & Western R.R.
Pawnee
15 mile limit for Plaintiff withdrawn July 1st 1862
10 mile limit withdrawn March 26th 1866
Survey commenced from 135 mile post Westward September 13th 1865
10 mile limit
20 mile limit for Plaintiff withdrawn July 31st 1862
Map of definite location thereof filed July 1st 1865
10 mile limit
20 mile limit for Defendant and withdrawn March 26th 1866
for Plaintiff withdrawn July 26th 1866
Sect 17
Sect 16
Sect 19
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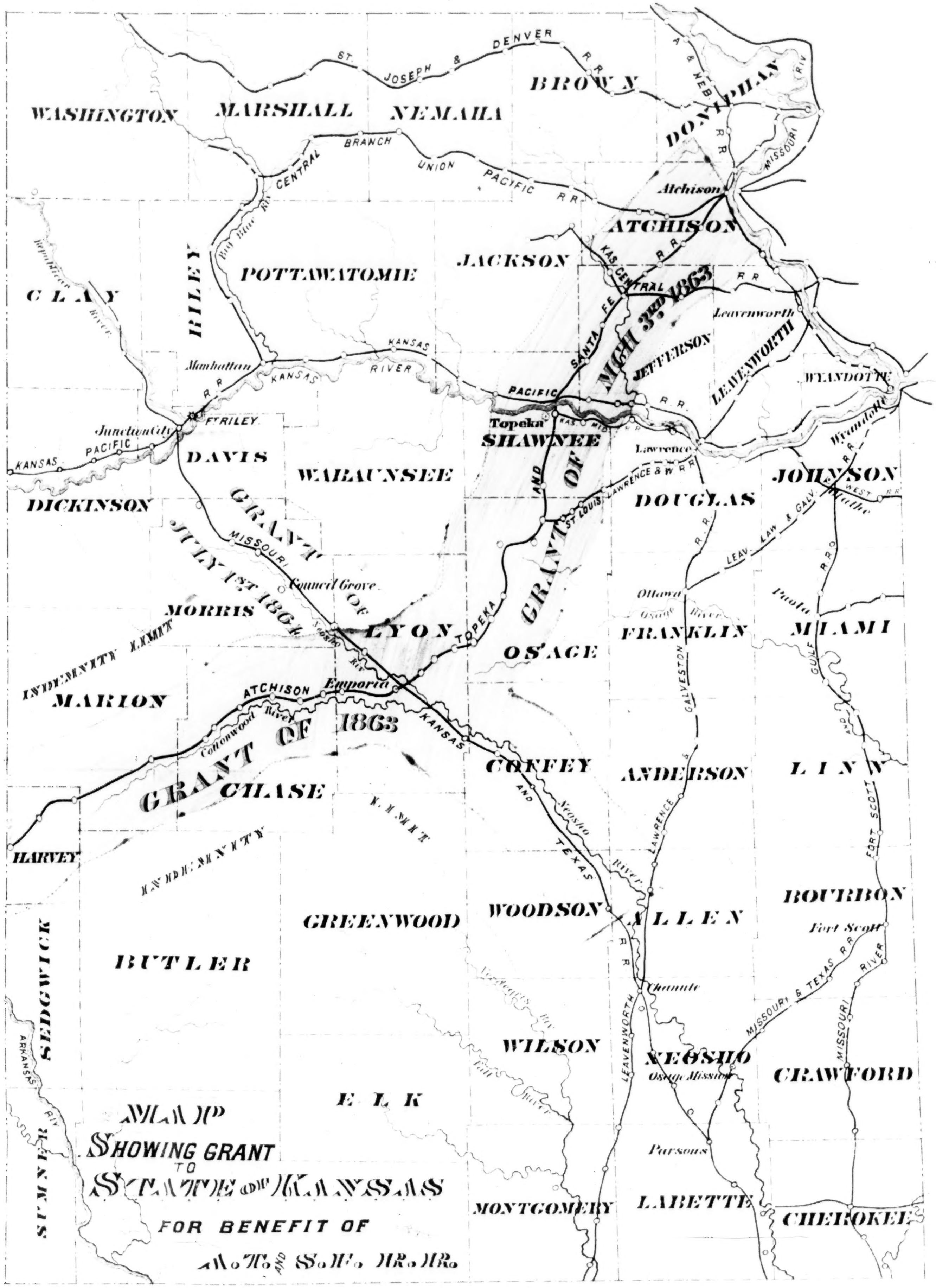

ST. JOSEPH & DENVER R.R.
A. & NEB. R.R.
WASHINGTON
MARSHALL
NEMAHA
BROWN
DONIPHAN
MISSOURI RIV.
CENTRAL BRANCH UNION PACIFIC R.R.
Big Blue Riv.
Atchison
ATCHISON
CLAY
RILEY
POTTAWATOMIE
JACKSON
KAS. CENTRAL R.R.
Republican River
GRANT OF MCH 3RD 1863
Leavenworth
JEFFERSON
LEAVENWORTH
KANSAS RIVER
KANSAS PACIFIC R.R.
SANTA FE
Manhattan
WYANDOTTE
Wyandotte
Junction City
FT. RILEY
Topeka
SHAWNEE
Lawrence
KANSAS PACIFIC
DAVIS
WABAUNSEE
ST. LOUIS, LAWRENCE & W. R.R.
JOHNSON
WEST R.R.
Olathe
DICKINSON
GRANT OF JULY 1ST 1864
MISSOURI
DOUGLAS
LEAV. LAW. & GALV.
Council Grove
Ottawa
Osage River
Paola
MORRIS
LYON
TOPEKA
FRANKLIN
MIAMI
INDEMNITY LIMIT
OSAGE
Neosho Riv.
MARION
ATCHISON
Emporia
Cottonwood River
GRANT OF 1863
KANSAS
GALVESTON
GULF R.R.
COFFEY
ANDERSON
LINN
CHASE
LIMIT
HARVEY
INDEMNITY
AND TEXAS
Neosho River
LAWRENCE
FORT SCOTT
BOURBON
WOODSON
ALLEN
GREENWOOD
Fort Scott
SEDGWICK
BUTLER
R.R.
Chanute
Verdigris Riv.
MISSOURI & TEXAS R.R.
MISSOURI RIVER
ARKANSAS RIV.
LEAVENWORTH
WILSON
NEOSHO
Osage Mission
CRAWFORD
Fall River
ELK
Parsons
SUMNER
MONTGOMERY
LABETTE
CHEROKEE

MAP
SHOWING GRANT
TO
STATE OF KANSAS
FOR BENEFIT OF
A. T. AND S. F. R. R.

No. 306.
The C. & N. W. R. R. Co.
vs.
Thomas Sayles.
Page 175.

Henry Tanner Ass. of Lafayette F. Thompson and Asahel G. Bachelder's Improved Brake for Railway Cars.

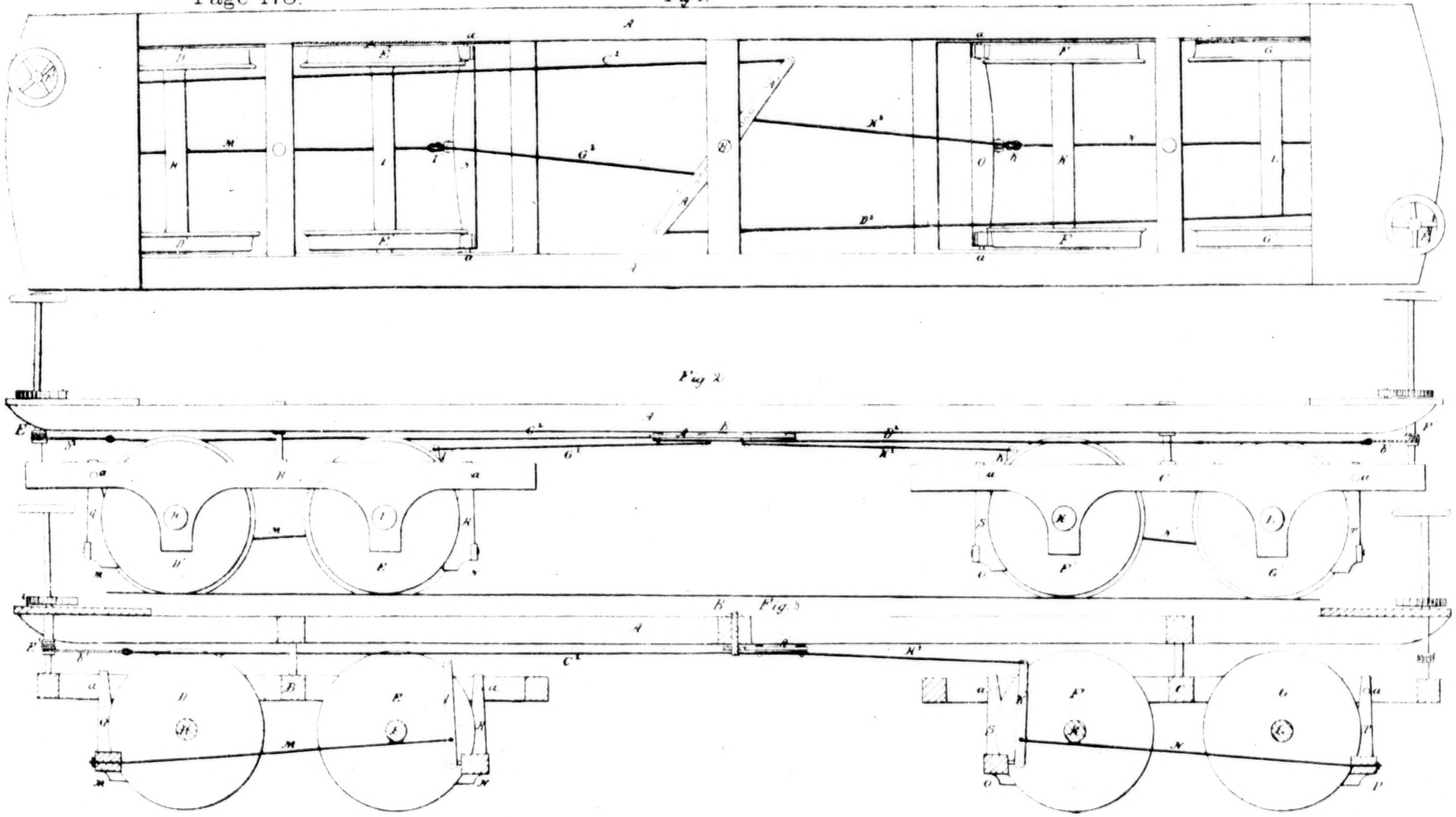
Fig. 1.
Fig. 2.
Fig. 3.
No. 8,119.
Thompson & Bachelder

①

No. 306.
The C. & N. W. R. R. Co.
vs.
Thomas Sayles.
Page 180.

F. A. STEVENS.

R. R. CAR BRAKES.

Patented Nov. 25, 1851.

No. 8552.

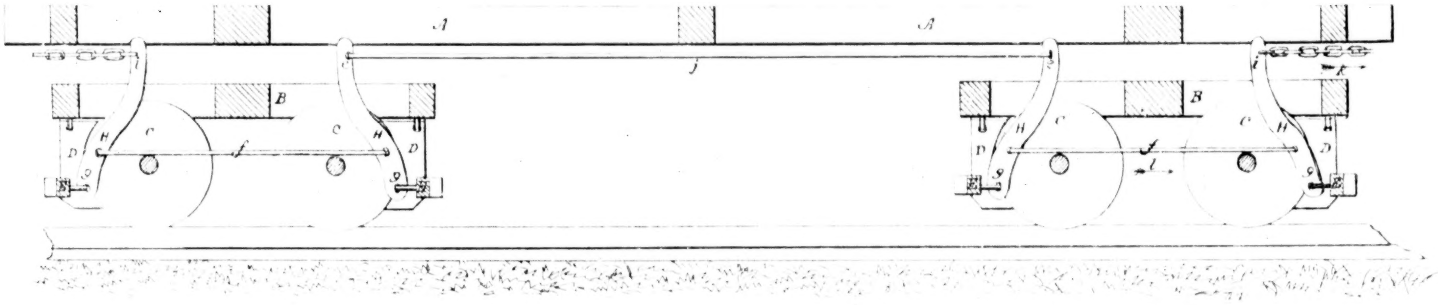
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Fig. 1. OLD SINGLE BRAKE.

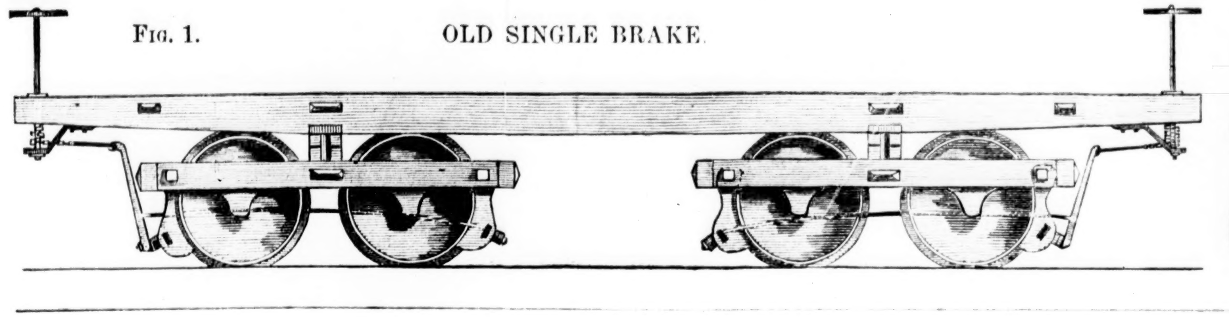
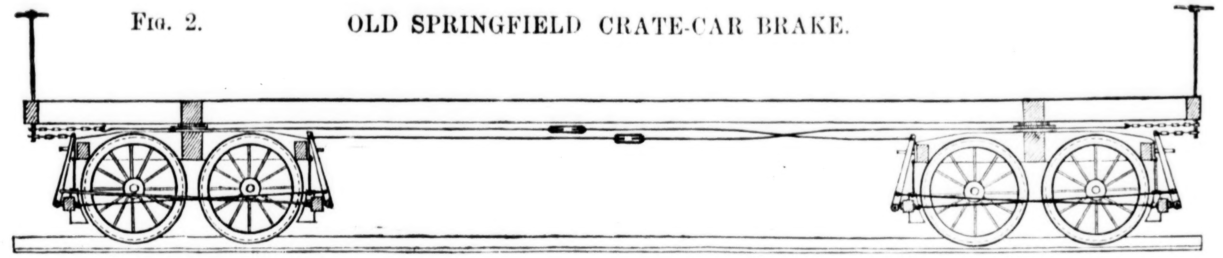
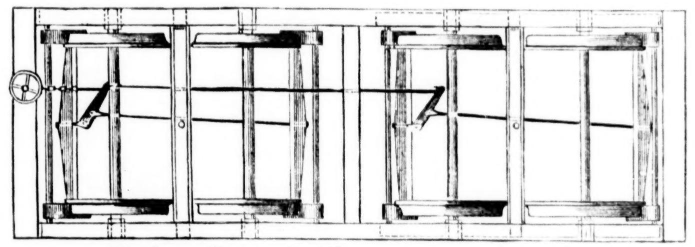


Fig. 2. OLD SPRINGFIELD CRATE-CAR BRAKE.



Used on two Crate-Cars on Boston & Albany Road two summers, as long as these cars were used for that purpose.

Fig. 3. OLD SPRINGFIELD TENDER BRAKE.



Used on Boston & Albany Road ever since 1841.

Fig. 4. MILLHOLLAND BRAKE.

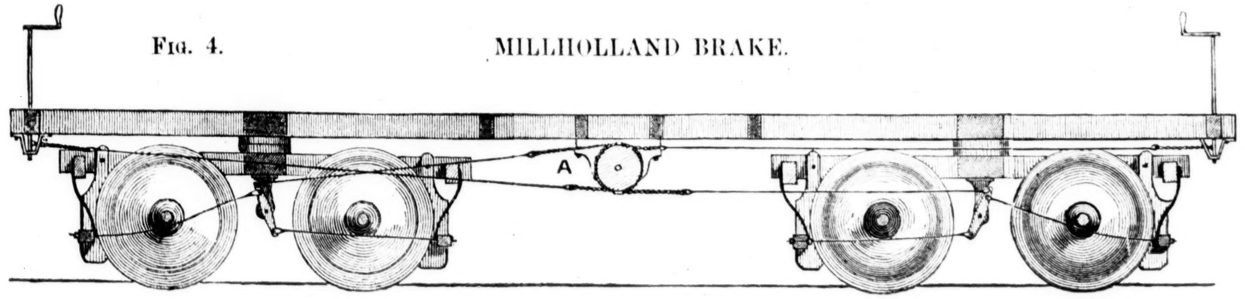


Fig 5. BATCHELDER & THOMPSON BRAKE.

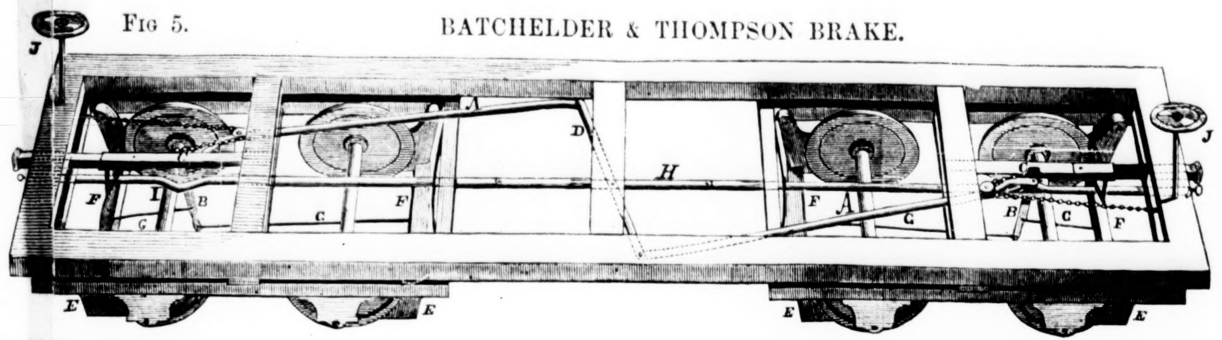


Fig. 6. TANNER BRAKE—Pat. July 6, 1852.

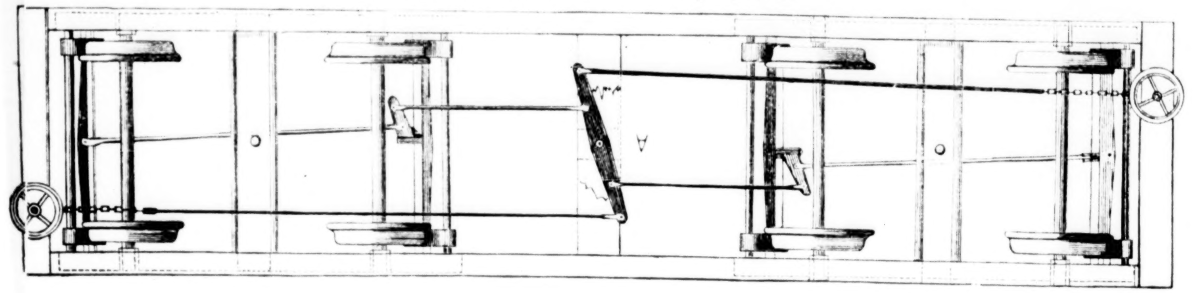


Fig. 7. STEVENS' BRAKE—Pat. Nov. 25, 1851.

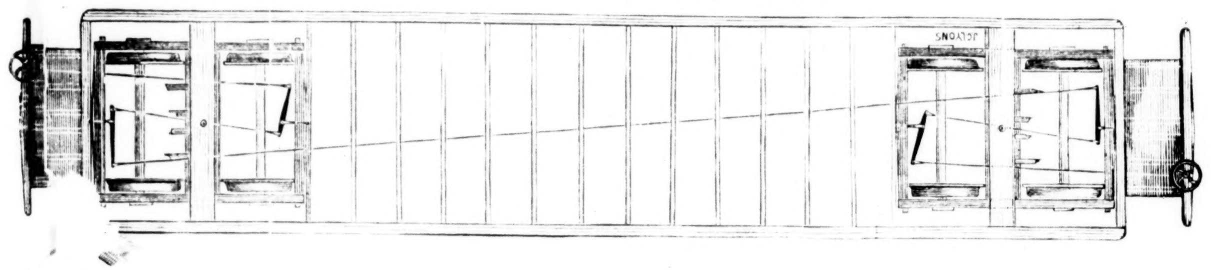
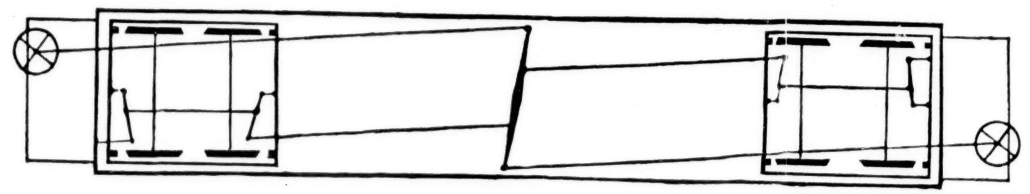


Fig. 8. TANNER-STEVENS' BRAKE.



Showing how Stevens *might* have infringed the Tanner Patent.

Fig. 9. HODGE BRAKE—Pat. Oct. 2, 1849.

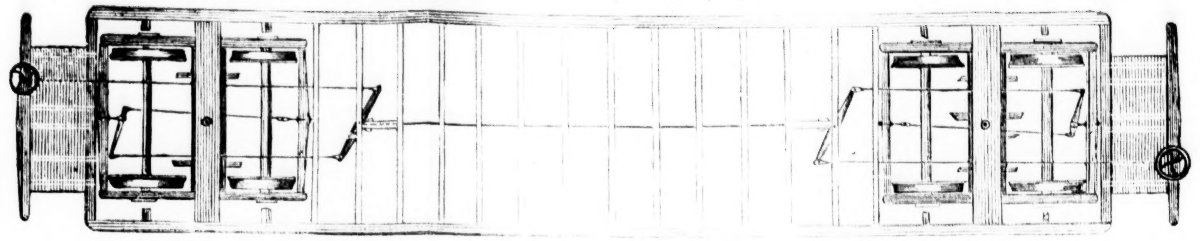


Fig. 10. GRIGGS' BRAKE—Pat. Dec. 31, 1839.

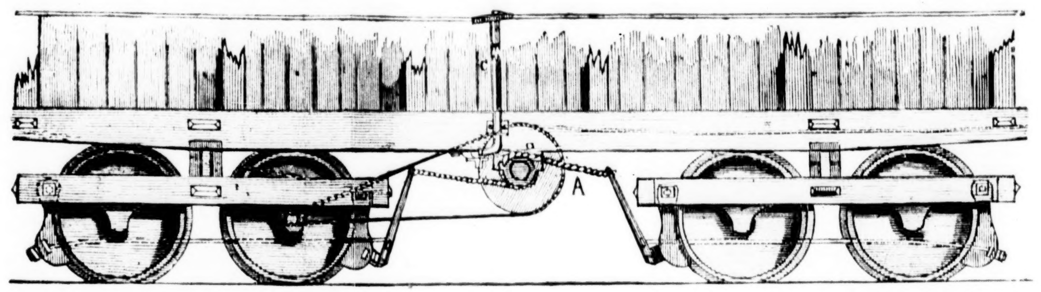
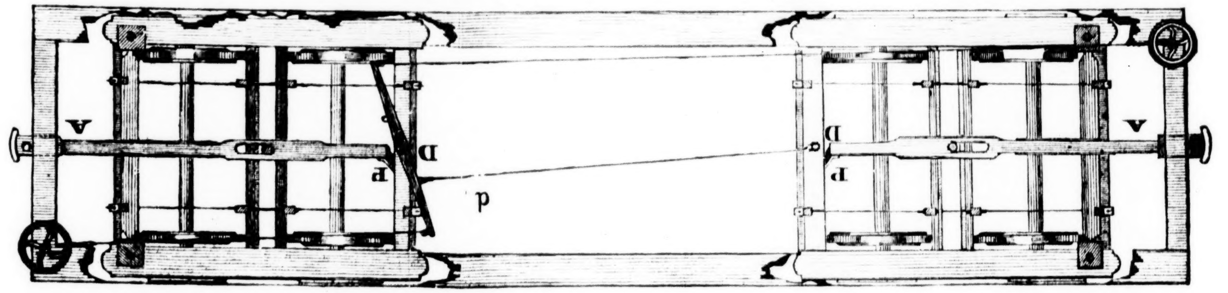
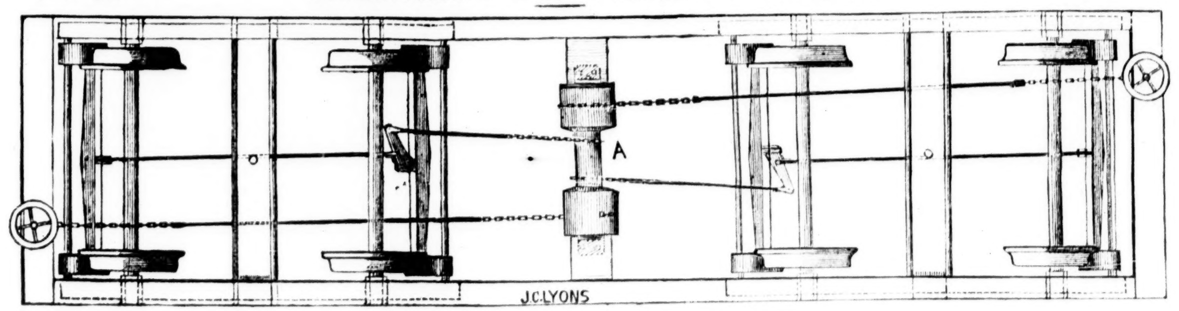


Fig. 11. TURNER BRAKE—Pat. Nov. 14, 1848.



Fig. 12. MILLHOLLAND BRAKE SLIGHTLY MODIFIED.